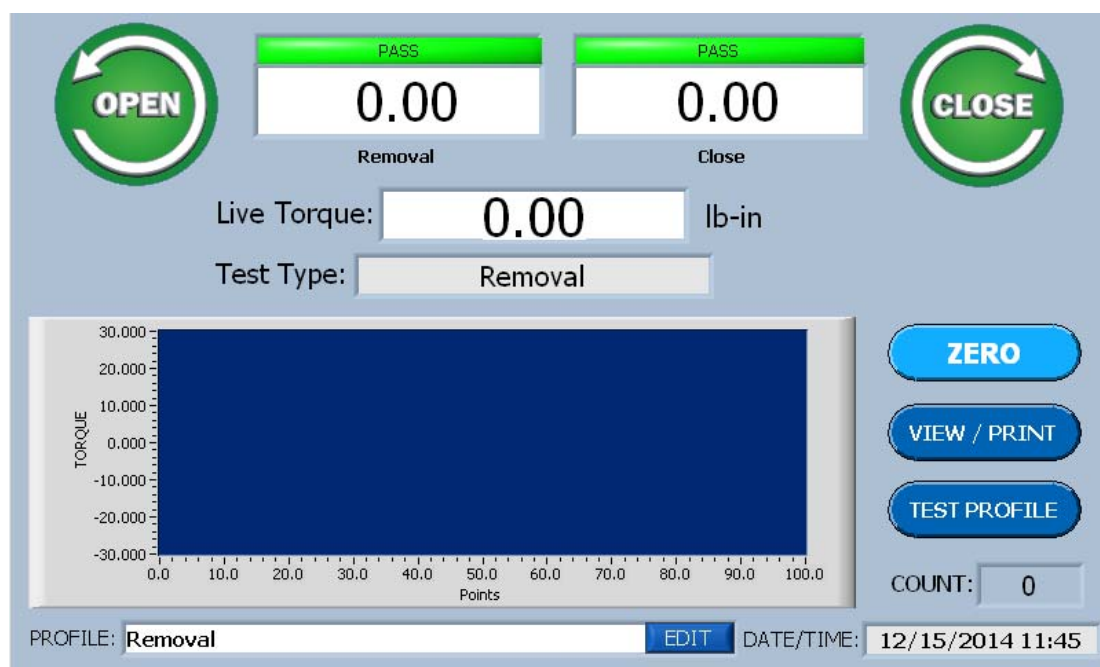


# 2100 Cap Inspector

By Vibrac LLC



## Vibrac®

PRECISION TEST SYSTEMS

1050 Perimeter Road

Manchester, NH 03103

Tel: 603.882.6777 Fax: 603.886.3857

www.vibrac.com



# Contents

- Overview 9**
  - Introduction ..... 9
  - What’s Inside ..... 9
  - About This Manual ..... 10
    - Chapter 1: Unpacking and Inspection ..... 10
    - Chapter 2: System Power Up ..... 10
    - Chapter 3: System Check ..... 10
    - Chapter 4: Modes of Operation ..... 10
    - Chapter 5: Profile Manager ..... 10
    - Chapter 6: Test Types ..... 10
    - Chapter 7: Creating a Removal Torque Test ..... 11
    - Chapter 8: Creating an Incremental Test ..... 11
    - Chapter 9: Creating a Removal & Bridge Test ..... 11
    - Chapter 10: Creating a Reverse Ratchet Test ..... 11
    - Chapter 11: Creating a Strip Torque Test ..... 11
    - Chapter 12: Creating an ROPP Test ..... 11
    - Chapter 13: Selecting the System Options ..... 11
    - Chapter 14: Quick Start ..... 11
    - Chapter 15: Viewing and Saving Test Results ..... 12
    - Chapter 16: Modifying Test Reports ..... 12
    - Chapter 17: Transmitting Test Results ..... 12
    - Chapter 18: Using The USB Features ..... 12
    - Chapter 19: Gold Standard Verification ..... 12
    - Chapter 20: Cap Inspector Calibration ..... 12
    - Chapter 21: Setting the Date and Time ..... 12
    - Chapter 22: Down Force Option ..... 12
  - Conventions ..... 13
  
- Unpacking And Inspection 14**
  - What’s Inside ..... 14
  - Unpacking and Inspection ..... 14
  - Checklist for Items supplied with the system ..... 15
  
- System Power Up and Down 16**
  - What’s Inside ..... 16
  - Powering Up the Cap Inspector ..... 16
  - Initial Display After Power-up ..... 17
    - Selecting a Profile from the Library ..... 17
  - Powering Down the Cap Inspector ..... 17
  - Correcting The Power On Lockup Condition ..... 18
    - Wait 30 Seconds ..... 18
  
- System Check 19**

What's Inside .....	19
Performing the System Check .....	19
Run Screen .....	19
Zeroing the System .....	20
Zero Instruction Screen .....	20
Performing The System Check .....	20
Open Button .....	21
Close Button .....	21

## **Modes of Operation 23**

What's Inside .....	23
Selecting a Mode .....	23
Profile Library .....	23
Run Mode (Main Menu).....	23
Program Mode (Main Menu).....	24
Password Protecting the System.....	24
Enter Password Menu.....	25
Deleting The Password.....	26
Invalid Password Screen.....	27
Forgot Password .....	27
Contact Vibrac.....	27

## **Profile Manager 28**

What's Inside.....	28
Profile Manager Button .....	28
Test Profile Manager Screen.....	28
Select Button .....	29
Edit Button .....	29
New Button.....	29
Delete Button.....	29
Save to USB .....	29
Print .....	29

## **Test Types 30**

What's Inside.....	30
Test Types.....	30
Select Test Type .....	31
Copy Profile .....	31
Test Definitions .....	32

## **Creating a Removal Torque Test 33**

What's Inside.....	33
Select Test Type .....	33
Keyboard For Removal Test.....	33
Removal Test Setup Screen .....	34
Removal Options .....	34
Removal Minimum Torque .....	34
Removal Peak Detect .....	35
Extra Travel.....	35
Removal Speed.....	35
Pass / Fail Limits .....	36
Removal Pass / Fail Low Limit .....	36
Removal Pass / Fail High Limit .....	36

Re-Application Options .....	37
Application Torque.....	37
Application Speed Prior to Slow Down.....	37
Application Slow Down At .....	38
Multi-Test Options.....	38
Multi-Test Run Options.....	38
Report Options.....	38
Edit Profile Header And Comment .....	39
Removal Test Run Screen.....	39

## **Creating an Incremental Test 40**

What's Inside.....	40
Select Test Type .....	40
Keyboard for the Incremental Test .....	40
Removal & Incremental Test Setup Screen .....	41
Removal Options .....	41
Removal Minimum Torque .....	41
Removal Peak Detect .....	42
Removal Pass / Fail Limits .....	42
Report Options.....	42
Incremental Pass / Fail Limits .....	42
Close Options .....	43
Application Torque.....	43
Removal & Incremental Test Run Screen.....	43

## **Creating a Removal & Bridge Test 44**

What's Inside.....	44
Select Test Type .....	44
Keyboard For Removal and Bridge Test .....	44
Removal and Bridge Test Setup Screens .....	45
Removal Options .....	45
Removal Minimum Torque .....	45
Removal Peak Detect .....	46
Removal Speed.....	46
Removal Pass / Fail Limits .....	46
Bridge Options.....	47
Bridge Distance .....	47
Bridge Initial Speed.....	47
Bridge Change Speed .....	48
Bridge Break Speed.....	48
Bridge Pass / Fail Limits.....	48
Re-Application Options .....	49
Re-Application Torque.....	49
Re-Application Speed.....	49
Re-Application Slow Down.....	50
Close Options .....	50
Application Torque.....	50
Report Options.....	51
Removal & Bridge Test Run Screen.....	51

## **Creating a Reverse Ratchet Test 52**

What's Inside.....	52
Select Test Type .....	52
Keyboard For Reverse Ratchet Test.....	52

Reverse Ratchet Test Setup Screen.....	53
Reverse Ratchet Options.....	53
Reverse Ratchet Minimum Torque.....	53
Reverse Ratchet Distance.....	54
Reverse Ratchet Direction.....	54
Reverse Ratchet Speed.....	54
Reverse Ratchet Pass / Fail Limits.....	54
Report Options.....	55
Reverse Ratchet Test Run Screen.....	55

## **Creating a Strip Torque Test 56**

What's Inside.....	56
Select Test Type.....	56
Keyboard For Strip Torque Test.....	56
Strip Test Setup Screen.....	57
Strip Test Options.....	57
Strip Minimum Torque.....	57
Strip Peak Detect.....	58
Strip Cutoff Torque.....	58
Strip Speed.....	58
Strip Slow Down At.....	59
Strip Pass / Fail Limit.....	59
Report Options.....	59
Strip Test Run Screen.....	60

## **Creating an ROPP CAP Test 61**

What's Inside.....	61
Select Test Type.....	61
Keyboard for ROPP Torque Test.....	61
ROPP Test Setup Screens.....	62
ROPP Screen Page 1.....	62
ROPP Screen Page 2.....	66
Removal Options.....	<b>Error! Bookmark not defined.</b>
Removal Minimum Torque.....	62
Removal Peak Detect.....	63
Removal Speed.....	63
Removal Pass / Fail Limits.....	63
Bridge Options.....	64
Bridge Distance.....	64
Bridge Initial Speed.....	64
Bridge Change Speed AT.....	65
Bridge Break Speed.....	65
Bridge Pass / Fail Limits.....	65
Strip Options.....	66
Strip Peak Detect.....	66
Strip Cutoff Torque.....	67
Strip Speed.....	67
Strip Slow Down At.....	67
Strip Pass / Fail Limits.....	68
ROPP Cap Test Run Screen.....	68

## **Selecting The System Options 69**

What's Inside.....	69
System Options Menu Page 1.....	69

Units of Measure .....	69
Standard Deviation .....	70
Auto Save Data .....	70
Auto Transmit to PC .....	71
Report Options .....	71
Decimal Places .....	71
Enter Number of Decimal Places .....	72
System Options Menu Page 2 .....	72
User Cal Weights .....	72
Add and Remove Weights .....	73
Calibration Selection .....	74
Delete Data .....	74
Printer .....	74
System Backup To USB .....	75
Restore Profiles from USB .....	75
<b>Quick Start .....</b>	<b>76</b>
What's Inside .....	76
Creating a New Profile .....	76
Performing the Test .....	80
Live Run Test Screen .....	80
<b>Viewing and Saving Test Results .....</b>	<b>81</b>
What's Inside .....	81
Saving a Test Result .....	81
Auto Save Data .....	82
Viewing Test Results .....	82
View / Print Report .....	82
<b>Modifying Test Reports .....</b>	<b>83</b>
What's Inside .....	83
Entering a Lot Number .....	83
Modifying the Report .....	84
Deleting Data .....	84
Saving To USB .....	85
<b>Transmitting Test Results .....</b>	<b>86</b>
What's Inside .....	86
Output Port .....	86
Connector Requirements .....	86
Pin Out .....	87
Communication Protocol .....	87
Data Format Information .....	87
Strip Torque .....	88
ROPP Torque .....	88
Transmitting Data Automatically .....	89
Transmitting End of Test Results Automatically .....	89
<b>Using the USB Features .....</b>	<b>90</b>
What's Inside .....	90
Backing up the System .....	90
Copying and Transferring Profiles .....	91

Restoring USB Files to System .....	91
Restore USB Button .....	91
Restore USB Screen .....	91
<b>Gold Standard Verification</b> .....	<b>93</b>
What's Inside.....	93
Vibrac Gold Standard Description.....	93
Calibration Verification with the Gold Standard .....	93
<b>Cap Inspector Calibration</b> .....	<b>96</b>
What's Inside.....	96
General Calibration Information.....	96
Calibration Frequency .....	96
Calibration Equipment.....	96
Required Calibration Tools .....	97
Performing a User Verification.....	97
Installing the Calibration Fixture.....	97
Installing the Calibration Beam .....	98
User Verification Zeroing Screen.....	99
User Verification Weight 1 Screen.....	99
User Verification Capture 1 Screen.....	99
User Verification Weight 2 Screen.....	100
User Verification Next Weight Screen .....	100
User Verification Report .....	101
Performing a User Calibration .....	101
User Calibration Screen 1.....	102
User Calibration Screen 2.....	102
User Calibration Screen 3.....	102
User Calibration / Verification Screen .....	103
Main Calibration Menu after Calibration .....	103
<b>Setting the Data and Time</b> .....	<b>104</b>
What's Inside.....	104
Edit Date and Time.....	104
Date and Time Menu.....	104
Edit Date and Time Screen.....	105
<b>Down Force Option</b> .....	<b>106</b>
What's Inside.....	106
About the Child Resistant Option .....	106
Connecting the Air Supply .....	106
Adjusting the Down Force .....	107
Down Force Mechanism Nomenclature .....	108
Adjusting the Down Force Foot.....	108
Operating the Child Resistant Mechanism.....	109
<b>Glossary of Terms</b> .....	<b>111</b>
<b>Index</b> .....	<b>113</b>



# Overview

---

## Introduction

Vibrac is an industry leader in the manufacture of precision torque measuring equipment. Over fifty years of experience in the torque-testing field is reflected in every new system.

Vibrac's commitment to supplying state of the art products has resulted in the development of the Model 2100 series of cap Inspectors.

A Windows 7 computer with an IP65 panel and a Resistive Touch screen operator interface will provide the user with years of trouble free service.

---

## What's Inside

This manual is designed to provide the user with a step-by-step procedure from receipt of the system through operation, maintenance and calibration.



Following the steps in the first three chapters of this manual will enable the user to rapidly become familiar with the basic operation of the system.

---

## About This Manual

For convenience, this manual is divided into a number of chapters. A brief description of each chapter follows.

### **Chapter 1: Unpacking and Inspection**

This chapter is a guide to insure that the Cap Inspector is received in proper condition and that all the necessary components have been located.

### **Chapter 2: System Power Up**

This chapter contains the required information for electrically connecting the system components and then powering up the system.

### **Chapter 3: System Check**

This chapter contains a step-by-step procedure to help the user become familiar with the basic operation of the Model 2101C Cap Inspector by performing a system check.

### **Chapter 4: Modes of Operation**

This chapter describes the functionality of the Run Mode and the Program Mode as well as how to limit access to the program mode with a password.

### **Chapter 5: Profile Manager**

This chapter contains a description of the programming features that can be used to create a profile for a specific test type and the menus that are used in the process.

### **Chapter 6: Test Types**

This chapter contains a description of the test types that can be selected.

## **Chapter 7: Creating a Removal Torque Test**

This chapter contains a step-by-step procedure for creating a Removal Torque Test.

## **Chapter 8: Creating an Incremental Test**

This chapter contains a step-by-step procedure for creating an Incremental Torque Test.

## **Chapter 9: Creating a Removal & Bridge Test**

This chapter contains a step-by-step procedure for creating a Removal and Bridge Torque Test.

## **Chapter 10: Creating a Reverse Ratchet Test**

This chapter contains a step-by-step procedure for creating a Reverse Ratchet Torque Test.

## **Chapter 11: Creating a Strip Torque Test**

This chapter contains a step-by-step procedure for creating a Strip Torque Test.

## **Chapter 12: Creating an ROPP Test**

This chapter contains a step-by-step procedure for creating an ROPP Cap Torque Test.

## **Chapter 13: Selecting the System Options**

This chapter contains a step-by-step procedure for selecting the system options that best suit the application.

## **Chapter 14: Quick Start**

This chapter contains a step-by-step procedure for creating a new profile; with an appropriate name that will measure the removal torque, re-apply the cap and compare the measurements with the programmed pass fail limits when the test is performed.

## **Chapter 15: Viewing and Saving Test Results**

This chapter contains a description of the procedure for saving test results and then viewing and printing these results.

## **Chapter 16: Modifying Test Reports**

This chapter contains a description of the procedure for modifying reports to fit the application.

## **Chapter 17: Transmitting Test Results**

This chapter provides a description of the output port, requirements, communication protocol and procedure for transmitting test results automatically.

## **Chapter 18: Using The USB Features**

This chapter describes in detail the use of a USB drive to backup the system and to restore profiles.

## **Chapter 19: Gold Standard Verification**

This chapter describes the calibration verification of the Cap Inspector with a Vibrac Gold Standard.

## **Chapter 20: Cap Inspector Calibration**

This chapter describes the entire calibration process, from the initial verification through the performance of a user calibration.

## **Chapter 21: Setting the Date and Time**

This chapter contains a description of the procedure for setting the Date and Time.

## **Chapter 22: Down Force Option**

This chapter describes the down force mechanism that is used for testing Child Resistant caps.

---

## Conventions

The following conventions are used in this manual.



### **Note:**

Provides additional information related to the current topic.



### **Warning:**

Alerts you to a danger that might result from doing or not doing a specific action



### **Caution:**

Suggests precautionary measures to avoid problems.



### **Important:**

Reminds you to take specific action relevant to the procedure at hand.



### **Tip:**

Tells how to accomplish a procedure with the minimum number of steps.

# Unpacking And Inspection

---

## What's Inside

This chapter provides the user with a checklist for the receipt of a new Model 2002C series Conversion Kit.

---

## Unpacking and Inspection

Your torque meter was carefully inspected, both electrically and mechanically before shipment. Upon receiving this system, carefully unpack all items from the shipping container and check for any signs of damage that may have occurred during shipment.



**Immediately report any shipping damage to the shipping agent**

Retain and use the original packing materials in case re-shipment is necessary.

---

## Checklist for Items supplied with the system

The following items are shipped with all 2101 Cap Inspectors.



Input power cable.



External Power Supply.



Operator's manual.

When calibration equipment is purchased with the system, the certificates of calibration for the beam and weights are included behind the front cover of the manual.

# System Power Up and Down

---

## What's Inside

This chapter contains the required information for powering up the Model 2101 Cap Inspector and turning it off.

---

## Powering Up the Cap Inspector



Following the steps below will energizes the system.

1. Insert the AC power cable into the power supply.
2. Connect the Power Supply to the receptacle, marked 24V DC on the rear of the Drive Tower.
3. Plug the other end of the AC power cable into an AC outlet.



The Model 2101 is supplied for use with 120 or 220 VAC 50 or 60 HZ. Consult the factory or your local sales representative for operation with other voltages.



**The use of a surge protector with the system is recommended as a protective measure against electrical noise.**

Now by actuating the switch on the rear of the tower the system will be energized and ready for use.



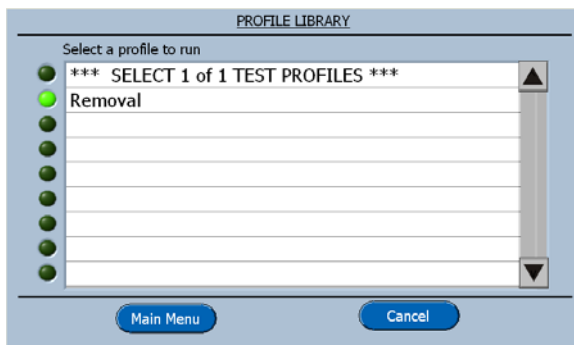
---

## Initial Display After Power-up



From the time the power switch is actuated, 2 to 3 minutes will pass while Windows and the 2101 programs are recalled from memory and loaded for use.

The Profile Library will appear on the touch screen when the system is ready.



Now by touching the word Removal, this profile will be selected to run.

The green LED next to it will be illuminated and the software will advance to the Run screen.

### Selecting a Profile from the Library



Remember to touch the word when making a selection not the green LED.

---

## Powering Down the Cap Inspector



Always use the Power Switch on the rear of the tower to turn the system off.



Do not exit to Windows and shut down like turning off a computer.

This will cause the software to get out of synchronization with the power off relay on the controller card.

The system will now be locked up and cannot be restarted with the Power Switch.

---

## Correcting The Power On Lockup Condition



The solution is to disconnect the AC power cord from the AC Outlet.

Please observe the Label on the rear panel of the tower.

See below

### Wait 30 Seconds

**WAIT**  
30 seconds  
before  
switching  
the power  
back on.

This 30-second delay will insure that the relay has enough time for its contacts to open before the power is turned back on.

# System Check

---

## What's Inside

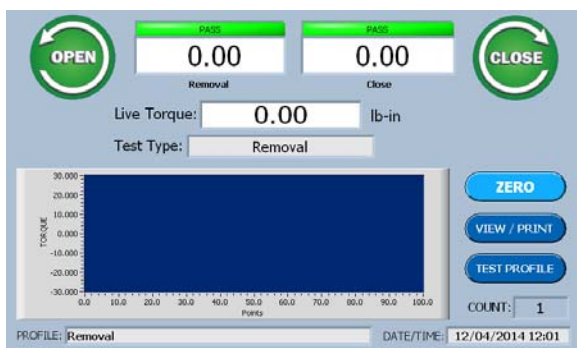
This chapter contains a step-by-step procedure to help the user become familiar with the basic operation of the Model 2101 Cap Inspector by performing a system check to verify that the drive is performing properly upon receipt.

---

## Performing the System Check

In the previous chapter the Removal Test was selected and therefore the Run Screen for the Removal Test will now be displayed.

### Run Screen



The Run Screen is the starting point for all tests. Its appearance will change slightly to match the selected test type.

Observe the Live Torque display in the center of the screen. When the drive shaft is in the up position and not connected to a sample to be tested, this display should read zero.

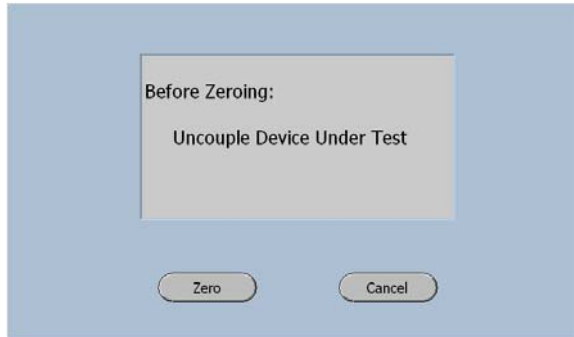
---

## Zeroing the System



If the display does not read zero, press the **Zero Key**.

### Zero Instruction Screen



The zero instruction screen will now be displayed as a precautionary measure.



**The system must never be zeroed when the shaft is coupled to the DUT. (Device Under Test)**

**This action can result in an offset that will effect the measurements.**

---

## Performing The System Check



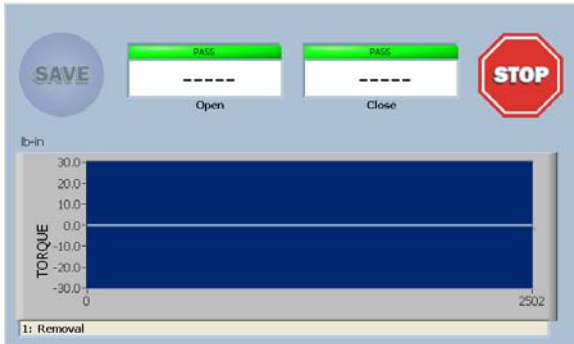
At this time, do not connect the Drive Shaft to anything.

The dynamic operation of the system can now be verified by pressing the Open Button and later the Close Button.

## Open Button



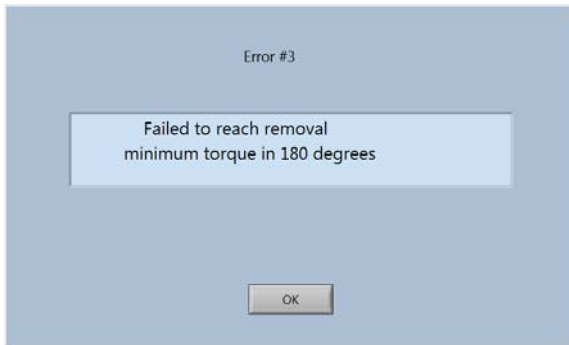
Observe the Drive shaft. It should be rotating in the same direction as the arrow on the Open Button when viewed from above. (CCW)



On the screen a live graph of the measured torque will be displayed.

The test will continue for 180 degrees looking for a value greater than 2 % of the full scale torque of the system

A line will be drawn across the graph at the zero position since there is no torque when the drive is not coupled to anything.



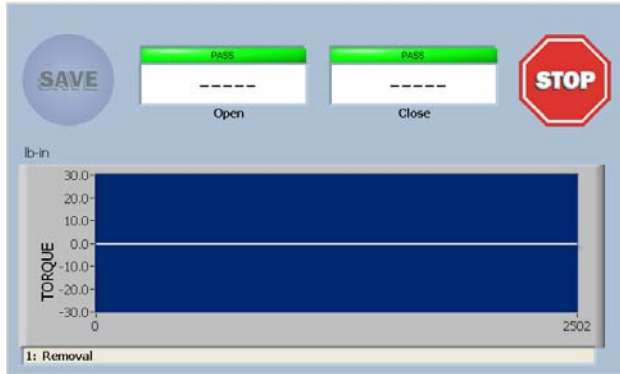
Since the torque is zero, when the 180-degree point is reached this error message will be displayed on the screen.

Selecting OK will return the program to the Run Screen.

## Close Button



Now by touching the Close button, the operation of the drive in the clockwise direction can be verified.



Once again a live display of torque will appear on the graph at the zero position.

The system will drive for 3 revolutions looking for the programmed application torque.



Since the torque is zero, after 3 revolutions this error message will be displayed.

Selecting OK will return the program to the Run Screen.

We have now verified that the drive is performing correctly.

# Modes of Operation

---

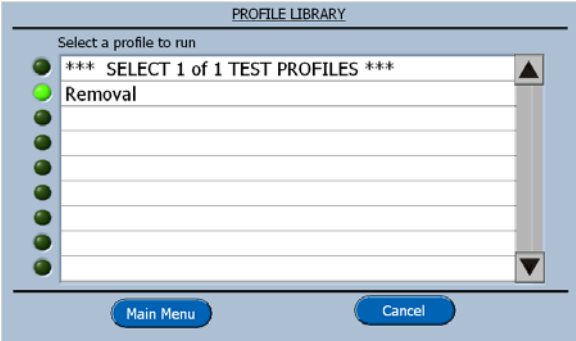
## What's Inside

This chapter describes the functionality of the Run Mode and the Program Mode as well as how to limit access to the program mode with a password.

---

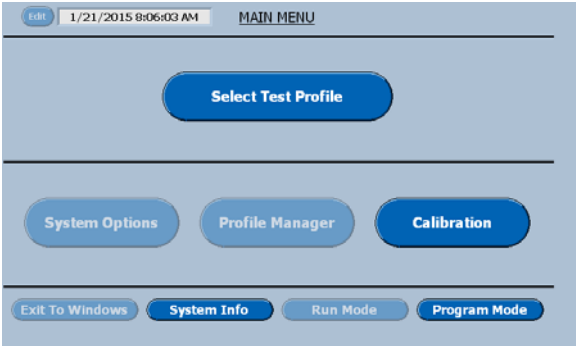
## Selecting a Mode

### Profile Library



The Profile Library is displayed at power up for the selection of the profile to be executed or the selection of the main menu for accessing other system features. When the main menu is selected here, the following screen will be displayed.

### Run Mode (Main Menu)



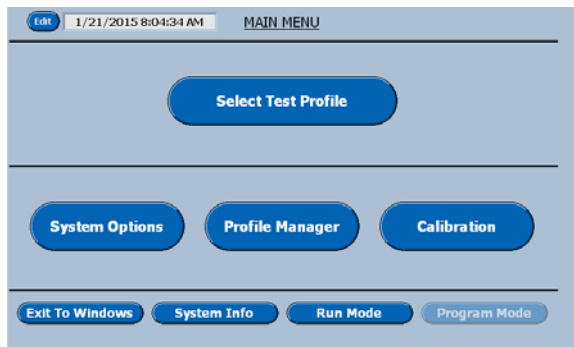
On power up, the software is defaulted to the Run Mode, when the Main Menu Button is selected.

A grayed out or dimmed button is either the **Selected Mode** or a feature that cannot be selected in the current mode.

## Program Mode

Touching Program Mode Button will toggle the selection from the Run Mode to the Program Mode.

### Program Mode (Main Menu)



In the program mode all the software features in the system are available to the user for creating and editing test profiles and selecting the options that best suit the application. Both calibration verifications and user calibrations can be initiated here. Each button on this menu will be the title of a chapter in this manual.

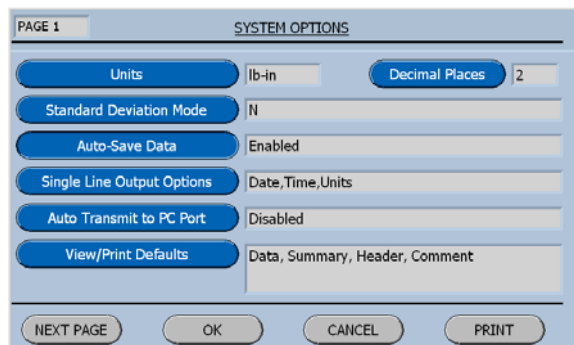
## Run Mode

Touching the Run Mode Button will toggle the selection back to the Run Mode.

### Password Protecting the System

The following procedure will provide for locking the system in the Run Mode and graying out the Program Mode Button.

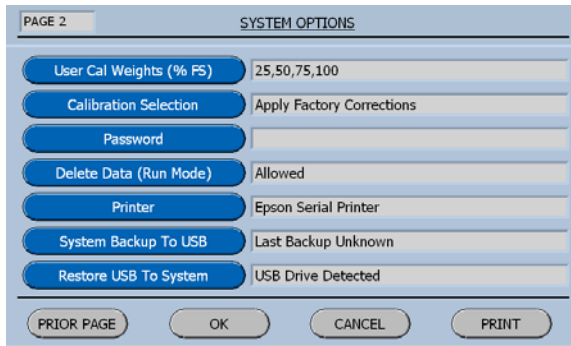
On the Main Menu select Program Mode.



On page 1 of the System Options menu select Next Page.

Now on page 2 of the System Options menu, select Password.





The Password Button will display the input screen for creating a password.

### Enter Password Menu



Carefully key in the password just as you intend to remember it.

Once entered here and accepted with the OK Button, the user will be required to enter it when attempting to enter the program mode.



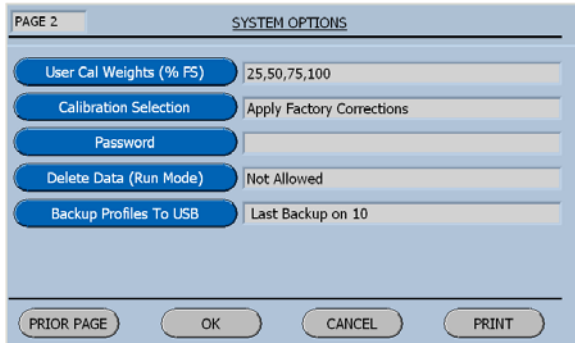
Once a password has been entered the user cannot enter the program mode without entering the password again.

The Password is case sensitive and must be entered precisely as it was first entered!

**RECORD THE PASSWORD IN A SAFE PLACE!**

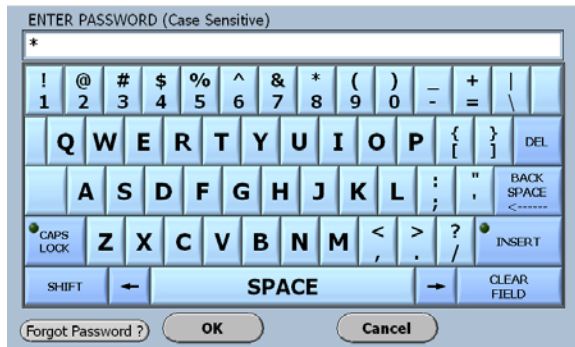
## Deleting The Password

In order to delete the password, the user must return to the System Option Menu page 2.



Now on page 2 of the System Options menu, select Password.

When Password is selected the following screen will be displayed.



When a Password has been entered an Asterisk will be displayed for each character that was entered.

Now by entering the correct password and selecting OK the software will advance to the Main Menu.

Now on the Main Menu select System Options and advance to page 2 and then select Password.



Now select the Clear Field Key and the displayed Asterisks will be deleted.

The Password is now deleted.

## Invalid Password Screen



The Invalid Password Screen will be displayed when an Invalid Password is entered. The OK Button will return the software to the Enter Password Screen wear the Forget Password Button can be selected.

## Forgot Password



The following screen will be displayed when this Button is pressed.

## Contact Vibrac



The contact person at Vibrac will first ask for the serial number of the system. This is necessary to provide the proper code to correct the problem.



Have you recorded the password in a safe place?

# Profile Manager

---

## What's Inside

This chapter contains a description of the programming features that can be used to create a Profile for a specific test type and the menus that are used in the process.

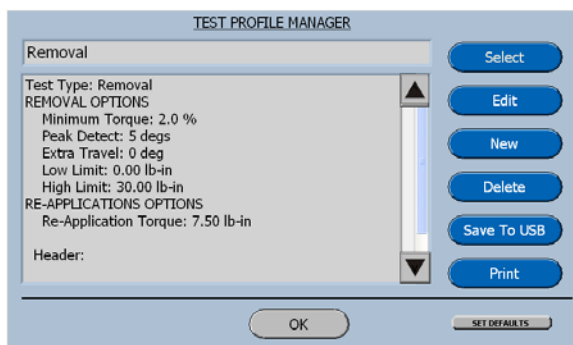
### Profile Manager Button



Touching this button accesses the profile manager screen.

---

## Test Profile Manager Screen



The Test Profile Manager screen displays the features of the currently selected test. The buttons on the right side of screen are used to create additional tests, edit the selected test, save tests to a USB drive and print the test profiles.



This button will return all the features of the current profile to their factory default value.

### Select Button



This button will advance the software to the Test Profile Library that is displayed on power up.

### Edit Button



This button will advance the software to the Test setup screen for the currently selected test Profile.

### New Button



This button will advance the software to the select test type menu for creating a new profile.

### Delete Button



This button will delete the currently selected Profile.

### Save to USB



This button enables the user to make a copy of the currently displayed Profile on a memory stick

### Print



This button will send the profile data in serial form to the RS232 port.

# Test Types

---

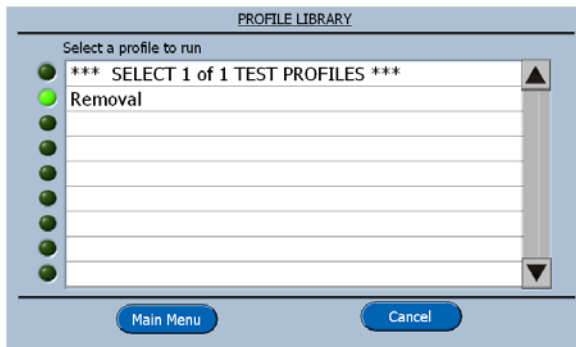
## What's Inside

This chapter contains a description of the test types that can be selected and the procedure for selecting a test type.

---

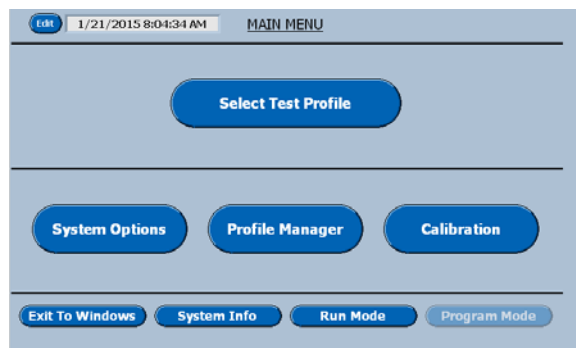
## Test Types

To view the Test Types follow the steps below.

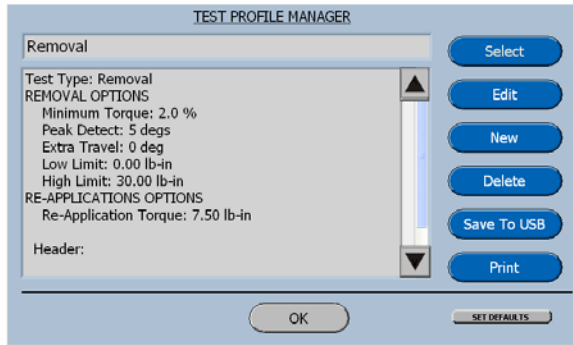


On the Profile Library screen touch the Main Menu Button.

The software will then advance to the Main Menu shown below.

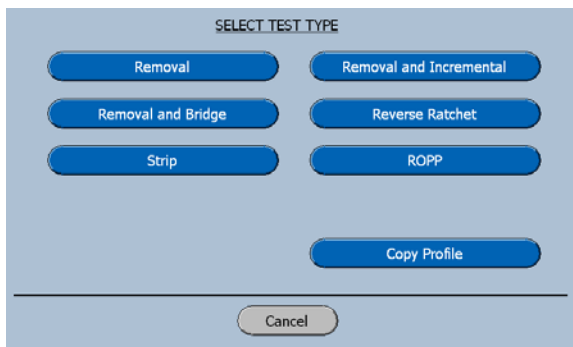


Now touch the Profile Manager Button and the software will display the features of the currently selected Profile.



Now on the Test Profile Manager Screen select **New** and the software will advance to the Select Test Type Menu.

## Select Test Type



This menu displays the six basic test types that can be used for creating new profiles.

When a Test Type is selected the software will advance to the Keyboard for naming the new profile.

Each of the items displayed here will be described in a chapter with the same name, with the exception of Copy Profile.

## Copy Profile



In many cases it will be quicker to copy a profile and then edit a couple items rather than create a whole new profile.

---

## Test Definitions

### Removal

The counter clockwise turning force required to remove an applied closure from a bottle finish.

### Removal and Incremental

The Removal portion of this test is the same as described above.

The Incremental portion is the clockwise turning force required to tighten an applied closure six degrees beyond its initial applied position.



The Removal and Incremental Test per Industry Standards is always performed at 1 RPM and the distance to drive is always six degrees when re-applying the cap.

### Removal and Bridge

The Removal portion of this test is the same as described above.

The Bridge portion is the counter clockwise turning force required to break the small strips of material that span the gap between the cap and the tamper evident band.

### Reverse Ratchet

The counter clockwise turning force required to rotate an applied child resistant closure without any down force.

### Strip

The clockwise turning force required to rotate the cap until the threads on the bottle or in the cap fail.

### ROPP

The Removal and the Bridge portion of this test is the same as described above. The Strip portion of this test measures the turning force required in the clockwise direction to cause the threads in the Aluminum Cap to fail.



# Creating a Removal Torque Test

---

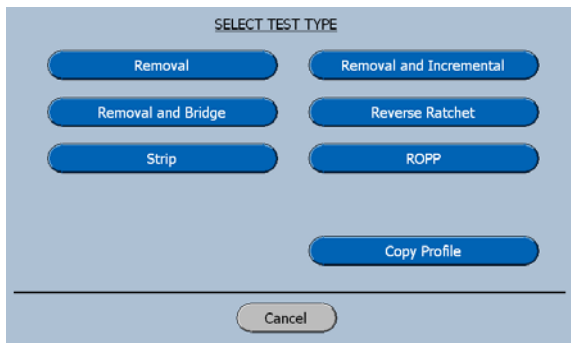
## What's Inside

This chapter contains a step-by-step procedure for creating a Removal Torque Test.

The procedure for displaying the select test type screen was described in the previous chapter.

---

## Select Test Type



On the Select Test Type screen select Removal.

The software will advance to the Enter Profile Name screen as shown below.

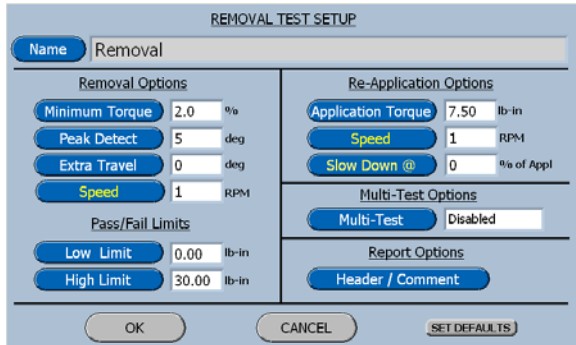
## Keyboard For Removal Test



For this manual the profile name, **Removal** has been entered.

Selecting OK will advance the software to the Removal Test Setup Screen shown below.

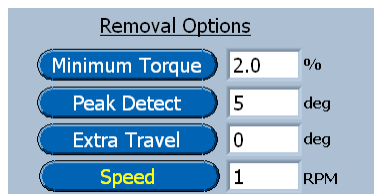
# Removal Test Setup Screen



The Removal Test Setup screen is divided into 5 groupings.

1. Removal Options
2. Pass/Fail Limits
3. Re-Application Options
4. Multi-Test Options
5. Report Options

## Removal Options



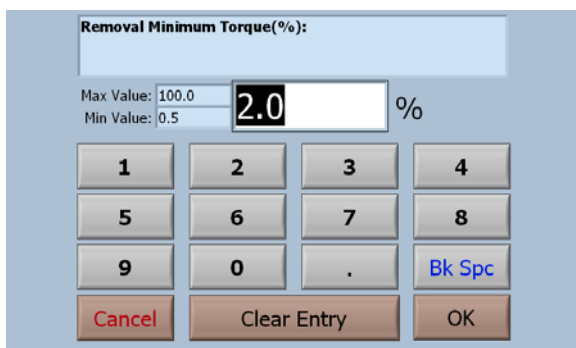
**Minimum Torque:** The torque value that must be exceeded before the removal torque is considered valid.

**Peak Detect:** The number of degrees of rotation after a peak has been measured for the software to accept this peak as the removal torque value.

**Extra Travel:** The distance to drive in the opening direction to leave the cap loose.

**Speed:** The drive speed to be used for the test.

## Removal Minimum Torque



**Observe the minimum and maximum values.**

To input a value, just start typing. The first key selected will overwrite the first highlighted value on the screen. When the desired value has been keyed in press OK to save the new value.

## Removal Peak Detect

Removal Peak Detect:

Max Value: 360  
Min Value: 2

5 Deg

1 2 3 4  
5 6 7 8  
9 0 . Bk Spc  
Cancel Clear Entry OK

**Observe the minimum and maximum values.**

To input a value, just start typing. The first key selected will overwrite the first highlighted value on the screen. When the desired value has been keyed in press OK to save the new value.

## Extra Travel

Extra Travel:

Note: If greater than 0, then Cap will not be re-applied.

Max Value: 9999  
Min Value: 0

0 deg

1 2 3 4  
5 6 7 8  
9 0 . Bk Spc  
Cancel Clear Entry OK

**Observe the minimum and maximum values.**

To input a value, just start typing. The first key selected will overwrite the first highlighted value on the screen. When the desired value has been keyed in press OK to save the new value.

## Removal Speed

Removal Speed:

Max Value: 5  
Min Value: 1

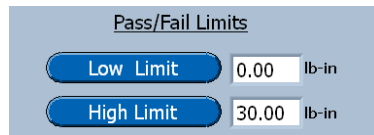
1 rpm

1 2 3 4  
5 6 7 8  
9 0 . Bk Spc  
Cancel Clear Entry OK

**Observe the minimum and maximum values.**

To input a value, just start typing. The first key selected will overwrite the first highlighted value on the screen. When the desired value has been keyed in press OK to save the new value.

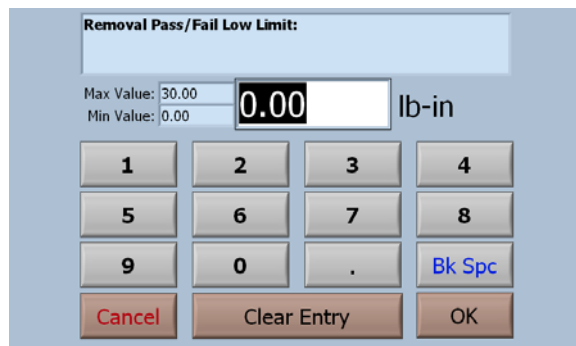
## Pass / Fail Limits



Low Limit: The Torque value that must be exceeded for the test to pass.

High Limit: The torque value that must not be exceeded for the test to pass.

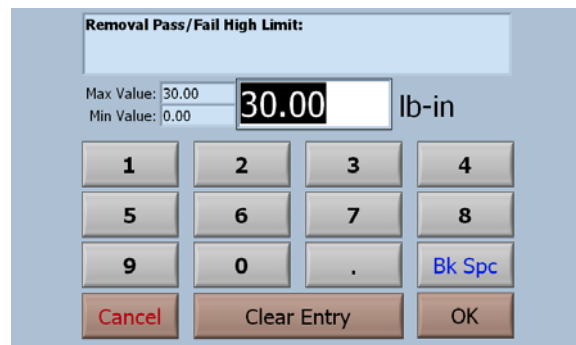
### Removal Pass / Fail Low Limit



**Observe the minimum and maximum values.**

To input a value, just start typing. The first key selected will overwrite the first highlighted value on the screen. When the desired value has been keyed in press OK to save the new value.

### Removal Pass / Fail High Limit



**Observe the minimum and maximum values.**

To input a value, just start typing. The first key selected will overwrite the first highlighted value on the screen. When the desired value has been keyed in press OK to save the new value.



The Pass / Fail Numeric Key Pads shown on this page will be used for programming the limits throughout this manual. However they will not be displayed in each chapter.

# Re-Application Options

Re-Application Options

Application Torque	7.50	lb-in
Speed	1	RPM
Slow Down @	0	% of Appl

Re-application Torque: This is the torque that the cap will be re-applied to after the removal test when Extra Travel is set to zero.

Speed: This is the speed at which the drive will rotate prior to the slow down to 1 RPM.

Slow Down @: This is the percent of application torque at which the drive will slow down to 1 RPM.

## Application Torque

Application Torque:

Max Value: 30.00  
Min Value: 0.00

7.50 lb-in

1	2	3	4
5	6	7	8
9	0	.	Bk Spc
Cancel	Clear Entry	OK	

**Observe the minimum and maximum values.**

To input a value, just start typing. The first key selected will overwrite the first highlighted value on the screen. When the desired value has been keyed in press OK to save the new value.

## Application Speed Prior to Slow Down

Application Speed (prior to 1 RPM Slow Down):

Max Value: 5  
Min Value: 1

1 rpm

1	2	3	4
5	6	7	8
9	0	.	Bk Spc
Cancel	Clear Entry	OK	

**Observe the minimum and maximum values.**

To input a value, just start typing. The first key selected will overwrite the first highlighted value on the screen. When the desired value has been keyed in press OK to save the new value.

## Application Slow Down At

Application Slow Down to 1 RPM  
(% of Application Torque):

Max Value: 100  
Min Value: 0

0 %

1 2 3 4  
5 6 7 8  
9 0 . Bk Spc  
Cancel Clear Entry OK

**Observe the minimum and maximum values.**

To input a value, just start typing. The first key selected will overwrite the first highlighted value on the screen. When the desired value has been keyed in press OK to save the new value.

---

## Multi-Test Options

Multi-Test Options

Multi-Test Enabled

When Multi is enabled the following screen will be displayed.

## Multi-Test Run Options

MULTI-TEST RUN TIME OPTIONS

Multi-Test Enabled

Default Number Of Tests 1

Nap Between Tests 1 sec

Operator Wait Between Tests Disabled

Lot Number Entry Enabled

Date Date Test Is Run

Note: "Operator Wait Between Tests" will occur after "Nap Between Tests"

OK CANCEL

This menu enables the user to perform a number of tests with a nap between tests to prevent over heating the threads.

It is frequently used for life testing a closure.

---

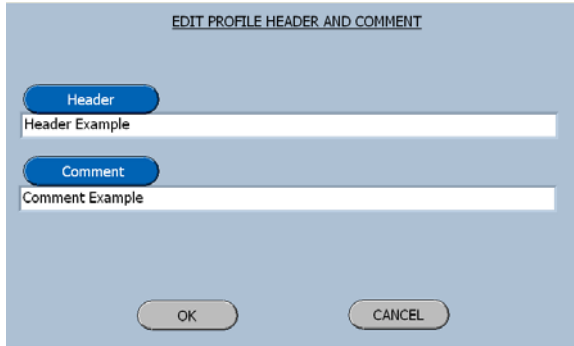
## Report Options

Report Options

Header / Comment

The Header and Comment Button will display the following menu.

## Edit Profile Header And Comment



EDIT PROFILE HEADER AND COMMENT

Header  
Header Example

Comment  
Comment Example

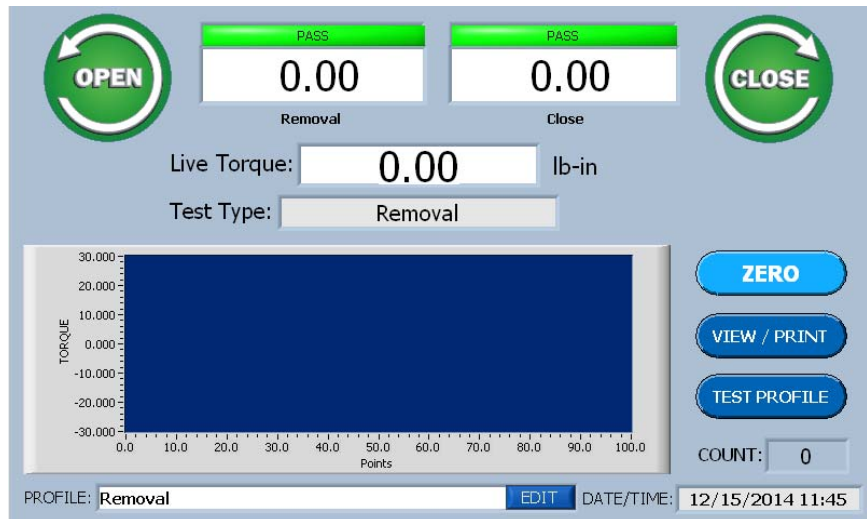
OK CANCEL

The Header and Comment entered here will appear on all reports.

---

## Removal Test Run Screen

When the removal test has been programmed and selected the run screen, shown below, will be displayed



OPEN PASS PASS CLOSE

0.00 0.00

Removal Close

Live Torque: 0.00 lb-in

Test Type: Removal

TORQUE

Points

ZERO VIEW / PRINT TEST PROFILE

COUNT: 0

PROFILE: Removal EDIT DATE/TIME: 12/15/2014 11:45

# Creating an Incremental Test

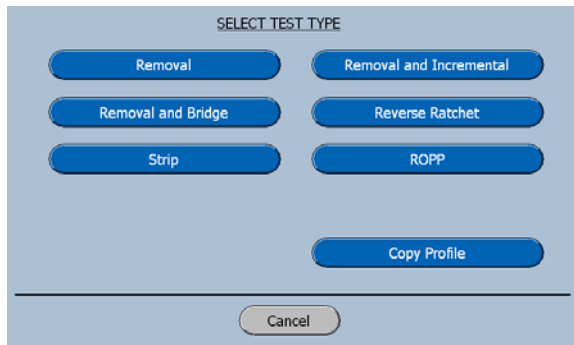
---

## What's Inside

This chapter contains a step-by-step procedure for creating an Incremental Torque Test.

---

## Select Test Type



On the Select Test Type screen select Removal and Incremental

The software will advance to the Enter Profile Name screen as shown below.

## Keyboard for the Incremental Test



For this manual the profile name, **Removal & Incremental** has been entered.

Selecting OK will advance the software to the Removal and Incremental Test Setup Screen shown below.



# Removal & Incremental Test Setup Screen

The Removal & Incremental Test Setup screen is divided into 5 groupings.

1. Removal Options
2. Pass/Fail Limits
3. Re-Application Options
4. Report Options
5. Close Options

## Removal Options

**Minimum Torque:** The torque value that must be exceeded before the removal torque is measured,

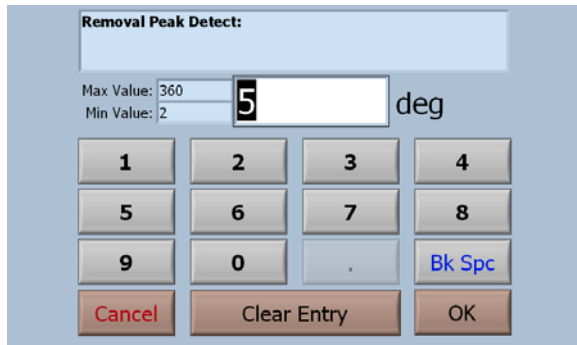
**Peak Detect:** The number of degrees of rotation after a peak has been measured for the software to accept this peak as the removal torque value.

## Removal Minimum Torque

**Observe the minimum and maximum values.**

To input a value, just start typing. The first key selected will overwrite the first highlighted value on the screen. When the desired value has been keyed in press OK to save the new value.

## Removal Peak Detect

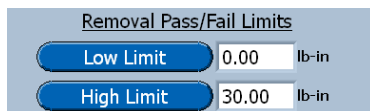


**Observe the minimum and maximum values.**

To input a value, just start typing. The first key selected will overwrite the first highlighted value on the screen. When the desired value has been keyed in press OK to save the new value.

---

## Removal Pass / Fail Limits

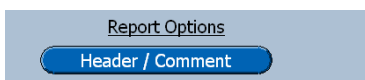


**Low Limit:** The Torque value that must be exceeded for the test to pass.

**High Limit:** The torque value that must not be exceeded for the test to pass.

---

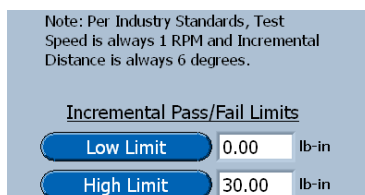
## Report Options



The Header and Comment will be displayed on all test reports for this test profile.

---

## Incremental Pass / Fail Limits

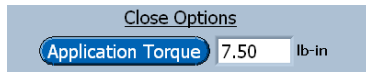


**Low Limit:** The Torque value that must be exceeded for the test to pass.

**High Limit:** The torque value that must not be exceeded for the test to pass.

---

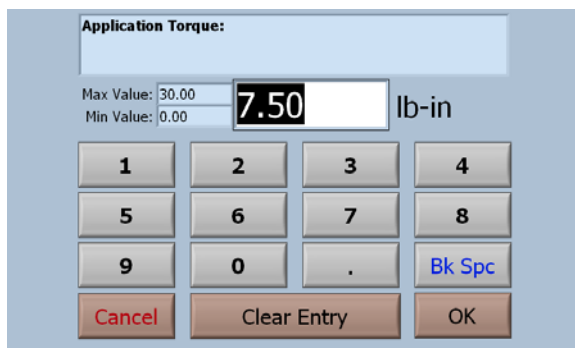
## Close Options



This is the torque value that will be used when the Close Button is pressed in the Incremental Test Mode.

The Close Option is seldom used in the Incremental Test Mode.

### Application Torque



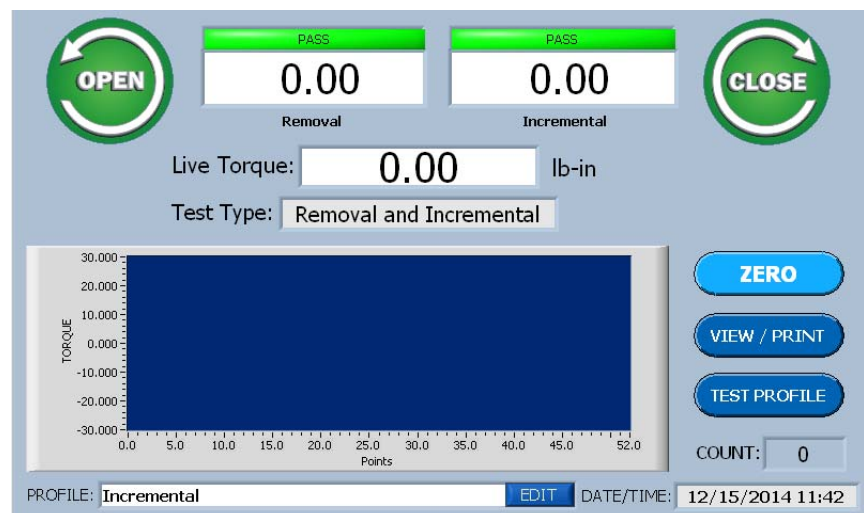
**Observe the minimum and maximum values.**

To input a value, just start typing. The first key selected will overwrite the first highlighted value on the screen. When the desired value has been keyed in press OK to save the new value.

---

## Removal & Incremental Test Run Screen

When the Removal & Incremental test has been programmed and selected the run screen, shown below, will be displayed



# Creating a Removal & Bridge Test

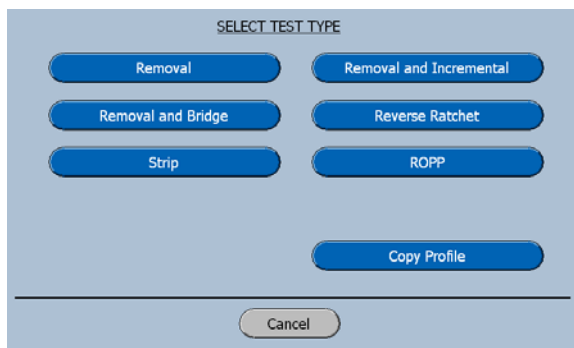
---

## What's Inside

This chapter contains a step-by-step procedure for creating a Removal and Bridge Test.

---

## Select Test Type



On the Select Test Type screen select Removal and Bridge.

The software will advance to the Enter Profile Name screen as shown below.

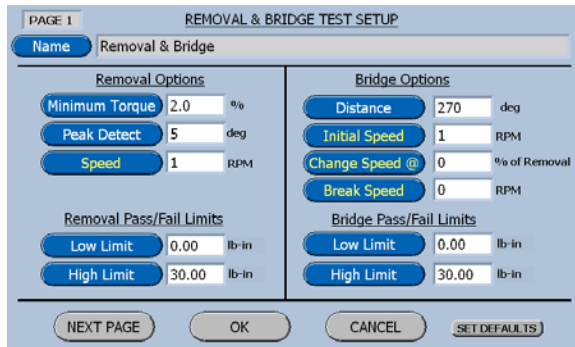
## Keyboard For Removal and Bridge Test



For this manual the profile name, **Removal & Bridge** has been entered.

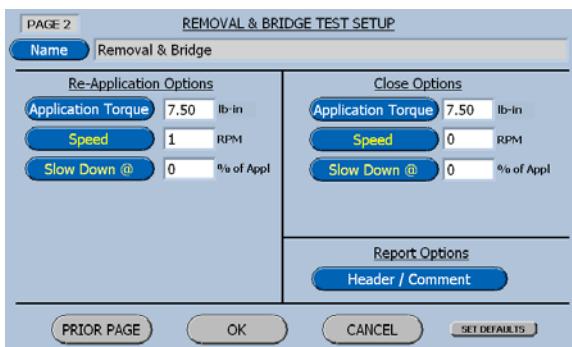
Selecting OK will advance the software to the Removal and Bridge Test Setup Screen shown below.

# Removal and Bridge Test Setup Screens



The Removal and Bridge test setup screen, page 1, is divided into 4 groupings.

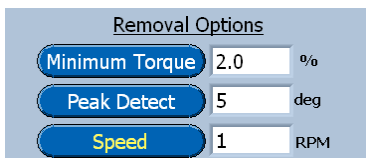
1. Removal Options
2. Removal Pass / Fail Options
3. Bridge Options
4. Bridge Pass / Fail Options



The Removal and Bridge test setup screen, page 2, is divided into 3 groupings.

1. Re-Application Option
2. Close Option
3. Report Options

## Removal Options

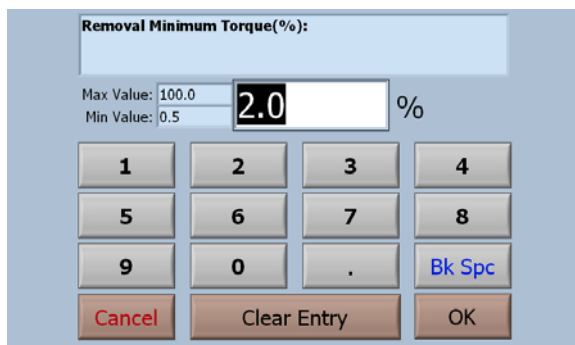


**Minimum Torque:** The torque value that must be exceeded before the removal torque is considered valid.

**Peak Detect:** The number of degrees of rotation after a peak has been measured for the software to accept this peak as the removal torque value.

**Speed:** The drive speed to be used for the test.

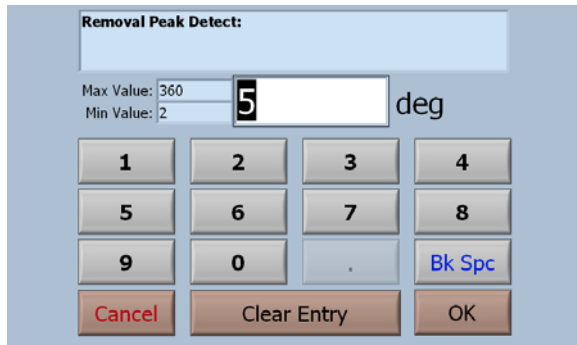
### Removal Minimum Torque



**Observe the minimum and maximum values.**

To input a value, just start typing. The first key selected will overwrite the first highlighted value on the screen. When the desired value has been keyed in press OK to save the new value.

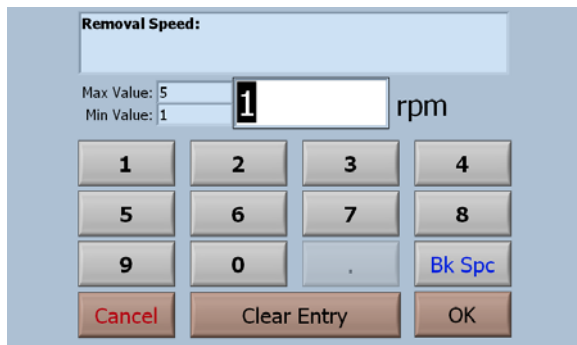
## Removal Peak Detect



**Observe the minimum and maximum values.**

To input a value, just start typing. The first key selected will overwrite the first highlighted value on the screen. When the desired value has been keyed in press OK to save the new value.

## Removal Speed

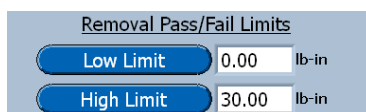


**Observe the minimum and maximum values.**

To input a value, just start typing. The first key selected will overwrite the first highlighted value on the screen. When the desired value has been keyed in press OK to save the new value.

---

## Removal Pass / Fail Limits



Low Limit: The Torque value that must be exceeded for the test to pass.

High Limit: The torque value that must not be exceeded for the test to pass.

# Bridge Options

A screenshot of the 'Bridge Options' menu. It contains four items, each with a blue button and a text input field: 'Distance' with '270 deg', 'Initial Speed' with '1 RPM', 'Change Speed @' with '0 % of Removal', and 'Break Speed' with '0 RPM'.

**Distance:** This is the distance to drive when measuring the torque required to break the Bridges after the removal torque has been measured.

**Initial Speed:** This is the speed that the system will drive at until the change speed torque value is reached.

**Change Speed:** This is the percentage of removal torque at which the system will change speed to perform the Bridge break test.

**Break Speed:** This is the speed that the system will drive at when breaking the bridges.

## Bridge Distance

A screenshot of the 'Bridge Distance' input screen. It shows a title bar 'Bridge Distance:', a text input field containing '270 deg', and range indicators 'Max Value: 360' and 'Min Value: 1'. Below is a numeric keypad with buttons for digits 1-9, 0, a decimal point, and 'Bk Spc'. At the bottom are 'Cancel', 'Clear Entry', and 'OK' buttons.

**Observe the minimum and maximum values.**

To input a value, just start typing. The first key selected will overwrite the first highlighted value on the screen. When the desired value has been keyed in press OK to save the new value.

## Bridge Initial Speed

A screenshot of the 'Initial Speed (At Start of Bridge Testing):' input screen. It shows a title bar, a text input field containing '1 rpm', and range indicators 'Max Value: 5' and 'Min Value: 1'. Below is a numeric keypad with buttons for digits 1-9, 0, a decimal point, and 'Bk Spc'. At the bottom are 'Cancel', 'Clear Entry', and 'OK' buttons.

**Observe the minimum and maximum values.**

To input a value, just start typing. The first key selected will overwrite the first highlighted value on the screen. When the desired value has been keyed in press OK to save the new value.

## Bridge Change Speed

Bridge Slow Down (% of Removal Torque):

Max Value: 100  
Min Value: 0

60 %

1 2 3 4  
5 6 7 8  
9 0 . Bk Spc

Cancel Clear Entry OK

**Observe the minimum and maximum values.**

To input a value, just start typing. The first key selected will overwrite the first highlighted value on the screen. When the desired value has been keyed in press OK to save the new value.

## Bridge Break Speed

Break Speed (After Bridge Speed Change):

Max Value: 5  
Min Value: 1

1 rpm

1 2 3 4  
5 6 7 8  
9 0 . Bk Spc

Cancel Clear Entry OK

**Observe the minimum and maximum values.**

To input a value, just start typing. The first key selected will overwrite the first highlighted value on the screen. When the desired value has been keyed in press OK to save the new value.

---

## Bridge Pass / Fail Limits

Bridge Pass/Fail Limits

Low Limit 0.00 lb-in

High Limit 30.00 lb-in

Low Limit: The Torque value that must be exceeded for the test to pass.

High Light: The torque value that must not be exceeded for the test to pass.



# Re-Application Options

Re-Application Options

Application Torque 7.50 lb-in

Speed 1 RPM

Slow Down @ 0 % of Appl

**Application Torque:** This is the torque that the cap will be re-applied to after the removal and bridge measurements are made.

**Speed:** This is the speed that the system will drive at until the slow down point is reached.

**Slow Down At:** This is the torque value at which point the drive will slow down to re-apply the cap at 1 RPM

## Re-Application Torque

Application Torque:

Max Value: 30.00  
Min Value: 0.00

7.50 lb-in

1 2 3 4  
5 6 7 8  
9 0 . Bk Spc  
Cancel Clear Entry OK

**Observe the minimum and maximum values.**

To input a value, just start typing. The first key selected will overwrite the first highlighted value on the screen. When the desired value has been keyed in press OK to save the new value.

## Re-Application Speed

Close Speed (prior to 1 RPM Slow Down):

Max Value: 5  
Min Value: 1

1 rpm

1 2 3 4  
5 6 7 8  
9 0 . Bk Spc  
Cancel Clear Entry OK

**Observe the minimum and maximum values.**

To input a value, just start typing. The first key selected will overwrite the first highlighted value on the screen. When the desired value has been keyed in press OK to save the new value.

## Re-Application Slow Down

Close Slow Down To 1 RPM  
(% of Application Torque):

Max Value: 100  
Min Value: 0

50 %

1 2 3 4  
5 6 7 8  
9 0 . Bk Spc  
Cancel Clear Entry OK

**Observe the minimum and maximum values.**

To input a value, just start typing. The first key selected will overwrite the first highlighted value on the screen. When the desired value has been keyed in press OK to save the new value.

---

## Close Options

Close Options

Application Torque 7.50 lb-in  
Speed 0 RPM  
Slow Down @ 0 % of Appl

Application Torque: This is the value that will be used when the Close Button is pressed in the Removal and Bridge Test Mode.

Speed:

## Application Torque

Application Torque:

Max Value: 30.00  
Min Value: 0.00

7.50 lb-in

1 2 3 4  
5 6 7 8  
9 0 . Bk Spc  
Cancel Clear Entry OK

**Observe the minimum and maximum values.**

To input a value, just start typing. The first key selected will overwrite the first highlighted value on the screen. When the desired value has been keyed in press OK to save the new value.

---

## Report Options

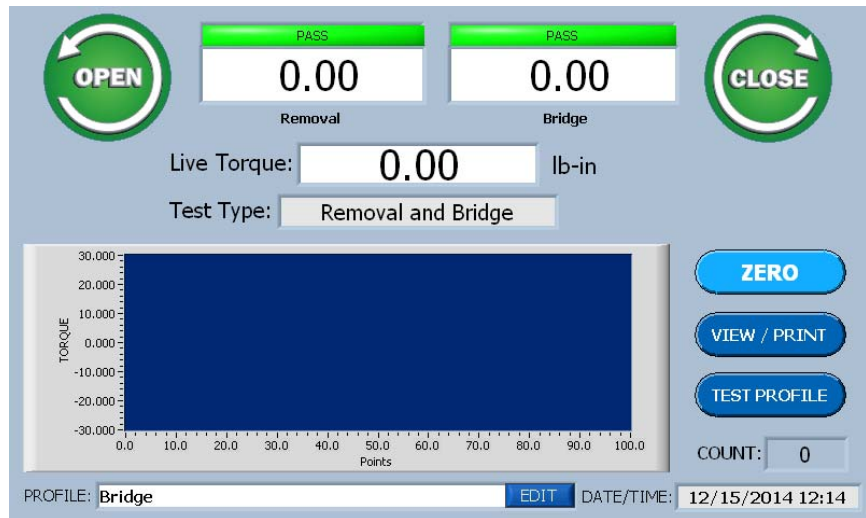


The Header and Comment will be displayed on all test reports for this test profile.

---

## Removal & Bridge Test Run Screen

When the Removal & Bridge test has been programmed and selected the run screen, shown below, will be displayed.



# Creating a Reverse Ratchet Test

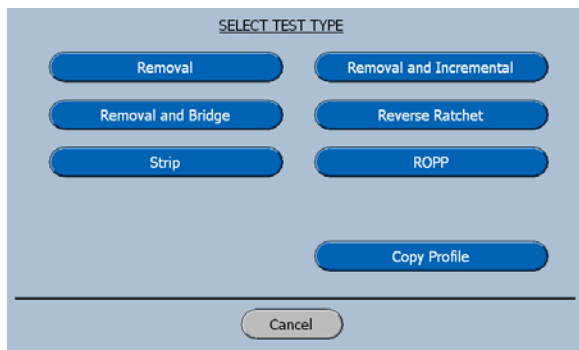
---

## What's Inside

This chapter contains a step-by-step procedure for creating a Reverse Ratchet Torque Test.

---

## Select Test Type



On the Select Test Type screen select Reverse Ratchet

The software will advance to the Enter Profile Name screen as shown below.

## Keyboard For Reverse Ratchet Test



For this manual the profile name, Reverse Ratchet has been entered.

Selecting OK will advance the software to the Reverse Ratchet Test Setup Screen shown below.

---

## Reverse Ratchet Test Setup Screen

The test setup screen is divided into 3 parts.

1. Reverse Ratchet Options
2. Reverse Ratchet Pass / Fail Limits
3. Report Options

---

## Reverse Ratchet Options

**Minimum Torque:** The torque value that must be exceeded before the torque test is considered valid.

**Distance:** This is the distance in degrees that the cap will be rotated while looking for the maximum torque.

**Direction:** This is the direction that will be used for the test

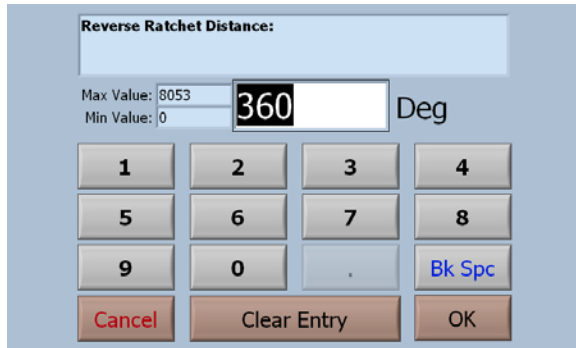
**Speed:** The drive speed to be used for the test.

### Reverse Ratchet Minimum Torque

**Observe the minimum and maximum values.**

To input a value, just start typing. The first key selected will overwrite the first highlighted value on the screen. When the desired value has been keyed in press OK to save the new value.

## Reverse Ratchet Distance



**Observe the minimum and maximum values.**

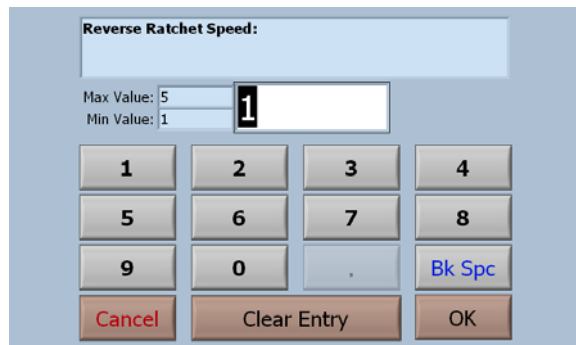
To input a value, just start typing. The first key selected will overwrite the first highlighted value on the screen. When the desired value has been keyed in press OK to save the new value.

## Reverse Ratchet Direction



The Direction Button is an alternate action switch that changes the direction with each actuation.

## Reverse Ratchet Speed



**Observe the minimum and maximum values.**

To input a value, just start typing. The first key selected will overwrite the first highlighted value on the screen. When the desired value has been keyed in press OK to save the new value.

---

## Reverse Ratchet Pass / Fail Limits

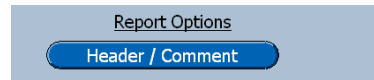


Low Limit: The Torque value that must be exceeded for the test to pass.

High Limit: The torque value that must not be exceeded for the test to pass.

---

## Report Options

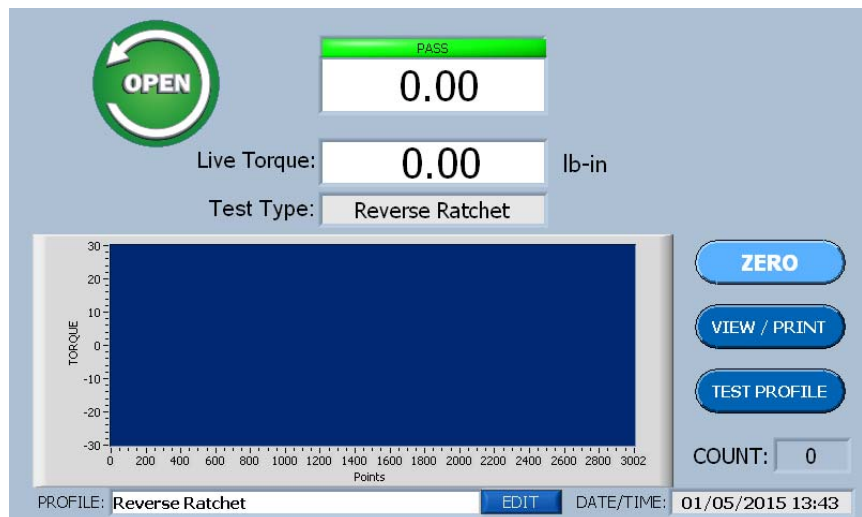


The Header and Comment will be displayed on all test reports for this test profile.

---

## Reverse Ratchet Test Run Screen

When the Reverse Ratchet test has been programmed and selected the run screen, shown below, will be displayed.



# Creating a Strip Torque Test

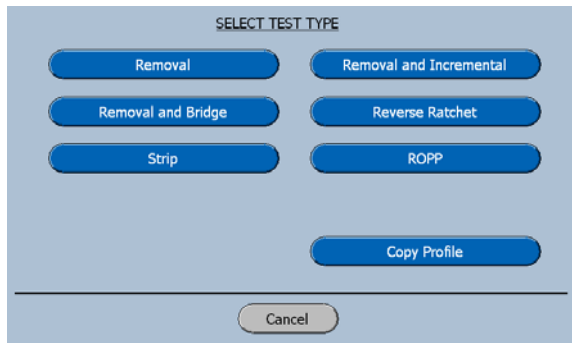
---

## What's Inside

This chapter contains a step-by-step procedure for creating a Strip Torque Test.

---

## Select Test Type



On the Select Test Type screen select Strip. The software will advance to the Enter Profile Name screen as shown below.

## Keyboard For Strip Torque Test

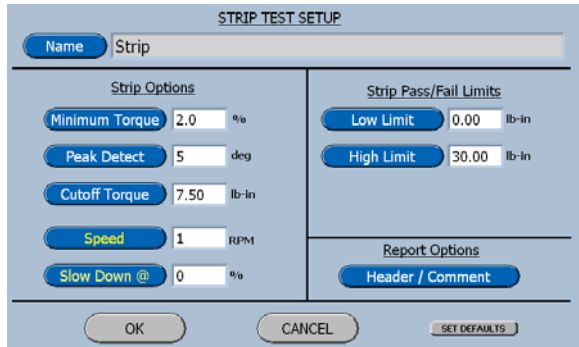


For this manual the profile name, Strip has been entered.

Selecting OK will advance the software to the Strip Test Setup Screen shown below.



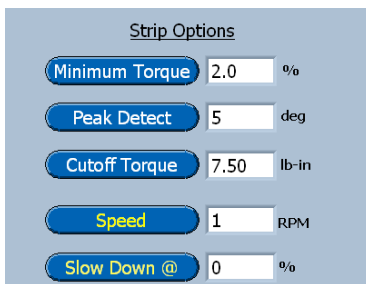
# Strip Test Setup Screen



The Strip Test Setup screen is divided into 3 parts.

1. Strip Options
2. Strip Pass / Fail Limits
3. Report Options

## Strip Test Options



**Minimum Torque:** The torque value that must be exceeded before the Strip Torque is measured.

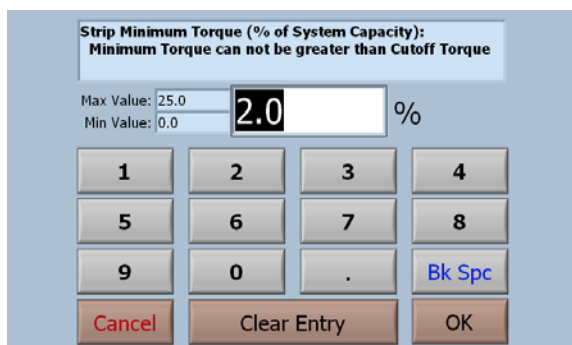
**Peak Detect:** The number of degrees of rotation after a peak has been measured for the software to accept this peak as the Strip Torque value.

**Cutoff Torque:** When the Cutoff Torque is reached the test will end.

**Speed:** The drive speed prior to slow down to 1 RPM test speed.

**Slow Down At:** A programmed percent of application torque to 1 RPM.

## Strip Minimum Torque



**Observe the minimum and maximum values.**

To input a value, just start typing. The first key selected will overwrite the first highlighted value on the screen. When the desired value has been keyed in press OK to save the new value.

## Strip Peak Detect

Strip Peak Detect:

Max Value: 360  
Min Value: 2

5 deg

1 2 3 4  
5 6 7 8  
9 0 . Bk Spc

Cancel Clear Entry OK

**Observe the minimum and maximum values.**

To input a value, just start typing. The first key selected will overwrite the first highlighted value on the screen. When the desired value has been keyed in press OK to save the new value.

## Strip Cutoff Torque

Strip Cutoff Torque:  
Cutoff Torque can not be less than Minimum Torque

Max Value: 30.00  
Min Value: 0.60

7.50 lb-in

1 2 3 4  
5 6 7 8  
9 0 . Bk Spc

Cancel Clear Entry OK

**Observe the minimum and maximum values.**

To input a value, just start typing. The first key selected will overwrite the first highlighted value on the screen. When the desired value has been keyed in press OK to save the new value.

## Strip Speed

Strip Speed (prior to 1 RPM Slow Down):

Max Value: 5  
Min Value: 1

1 rpm

1 2 3 4  
5 6 7 8  
9 0 . Bk Spc

Cancel Clear Entry OK

**Observe the minimum and maximum values.**

To input a value, just start typing. The first key selected will overwrite the first highlighted value on the screen. When the desired value has been keyed in press OK to save the new value.

## Strip Slow Down At

Strip Slow Down To 1 RPM  
(% of Application Torque):

Max Value: 100  
Min Value: 0

0 %

1 2 3 4  
5 6 7 8  
9 0 . Bk Spc  
Cancel Clear Entry OK

### Observe the minimum and maximum values.

To input a value, just start typing. The first key selected will overwrite the first highlighted value on the screen. When the desired value has been keyed in press OK to save the new value.

## Strip Pass / Fail Limit

Strip Pass/Fail Limits

Low Limit 0.00 lb-in

High Limit 30.00 lb-in

Low Limit: The Torque value that must be exceeded for the test to pass.

High Limit: The torque value that must not be exceeded for the test to pass.

---

## Report Options

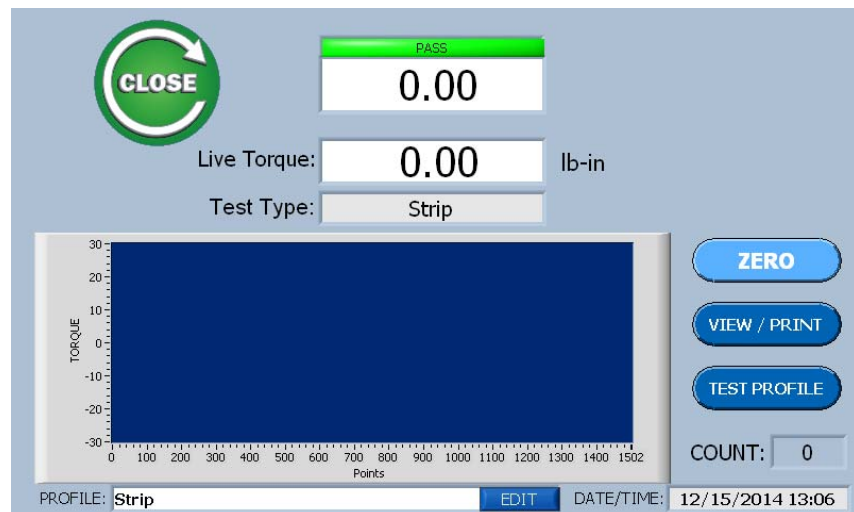
Report Options

Header / Comment

The Header and Comment will be displayed on all test reports for this test profile.

## Strip Test Run Screen

When the Strip Torque test has been programmed and selected the run screen, shown below, will be displayed.



# Creating an ROPP CAP Test

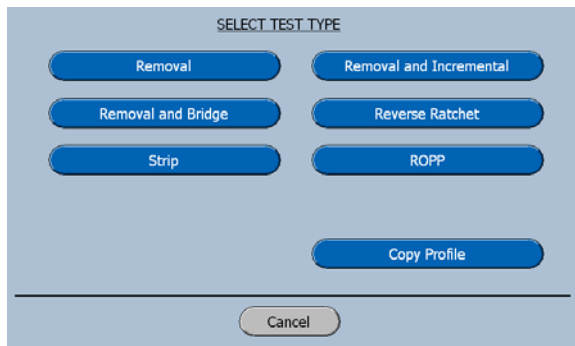
---

## What's Inside

This chapter contains a step-by-step procedure for creating an ROPP Cap Torque Test.

---

## Select Test Type



On the Select Test Type screen select ROPP. The software will advance to the Enter Profile Name screen as shown below.

## Keyboard for ROPP Torque Test



For this manual the profile name, ROPP has been entered.

Selecting OK will advance the software to the ROPP Test Setup Screen shown below.

---

# ROPP Test Setup Screens

## ROPP Screen Page 1

The ROPP Test Setup Screen (page 1) is divided into 4 parts.

1. Removal Options
2. Removal Pass / Fail Limits
3. Bridge Options
4. Bridge Pass / Fail Limits

---

## Removal Options

**Minimum Torque:** The torque value that must be exceeded before the removal torque is considered valid.

**Peak Detect:** The number of degrees of rotation after a peak has been measured for the software to accept this peak as the removal torque value.

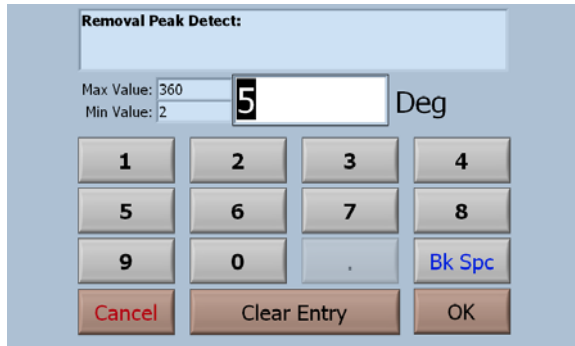
**Speed:** The drive speed to be used for the test.

## Removal Minimum Torque

**Observe the minimum and maximum values.**

To input a value, just start typing. The first key selected will overwrite the first highlighted value on the screen. When the desired value has been keyed in press OK to save the new value.

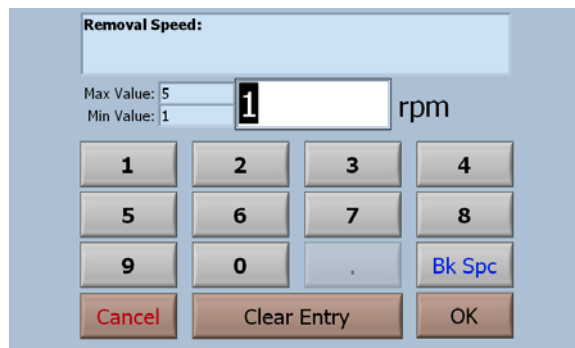
## Removal Peak Detect



**Observe the minimum and maximum values.**

To input a value, just start typing. The first key selected will overwrite the first highlighted value on the screen. When the desired value has been keyed in press OK to save the new value.

## Removal Speed

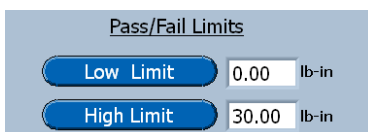


**Observe the minimum and maximum values.**

To input a value, just start typing. The first key selected will overwrite the first highlighted value on the screen. When the desired value has been keyed in press OK to save the new value.

---

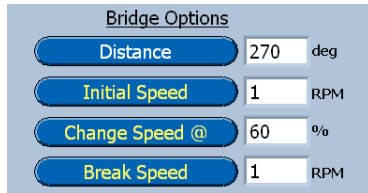
## Removal Pass / Fail Limits



**Low Limit:** The Torque value that must be exceeded for the test to pass.

**High Limit:** The torque value that must not be exceeded for the test to pass.

# Bridge Options



Bridge Options

- Distance: 270 deg
- Initial Speed: 1 RPM
- Change Speed @: 60 %
- Break Speed: 1 RPM

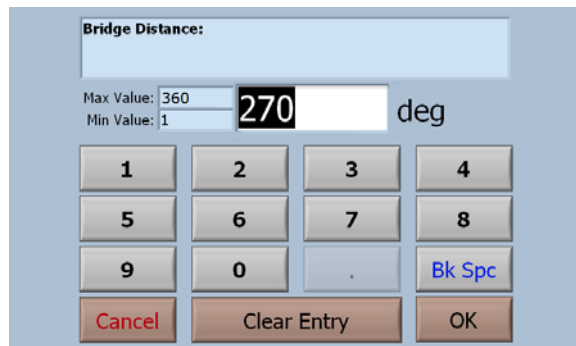
**Distance:** This is the distance to drive when measuring the torque required to break the Bridges after the removal torque has been measured.

**Initial Speed:** This is the speed that the system will drive at after the Removal measurement has been made.

**Change Speed:** This is the torque at which the system will change to the speed for performing the bridge break.

**Break Speed:** This is the speed at which the bridges will be broken.

## Bridge Distance



Bridge Distance:

Max Value: 360  
Min Value: 1

270 deg

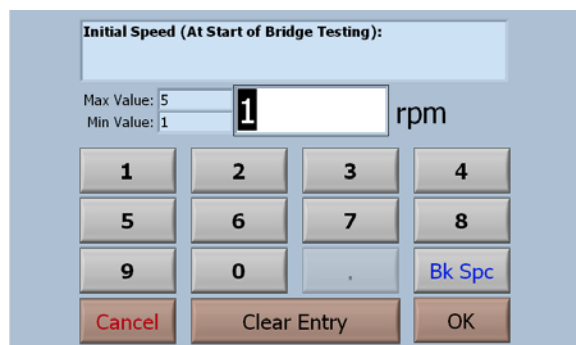
1 2 3 4  
5 6 7 8  
9 0 . Bk Spc

Cancel Clear Entry OK

**Observe the minimum and maximum values.**

To input a value, just start typing. The first key selected will overwrite the first highlighted value on the screen. When the desired value has been keyed in press OK to save the new value.

## Bridge Initial Speed



Initial Speed (At Start of Bridge Testing):

Max Value: 5  
Min Value: 1

1 rpm

1 2 3 4  
5 6 7 8  
9 0 . Bk Spc

Cancel Clear Entry OK

**Observe the minimum and maximum values.**

To input a value, just start typing. The first key selected will overwrite the first highlighted value on the screen. When the desired value has been keyed in press OK to save the new value.



## Bridge Change Speed AT

Bridge Slow Down (% of Removal Torque):

Max Value: 100  
Min Value: 0

60 %

1 2 3 4  
5 6 7 8  
9 0 . Bk Spc  
Cancel Clear Entry OK

**Observe the minimum and maximum values.**

To input a value, just start typing. The first key selected will overwrite the first highlighted value on the screen. When the desired value has been keyed in press OK to save the new value.

## Bridge Break Speed

Break Speed (After Bridge Speed Change):

Max Value: 5  
Min Value: 1

1 rpm

1 2 3 4  
5 6 7 8  
9 0 . Bk Spc  
Cancel Clear Entry OK

**Observe the minimum and maximum values.**

To input a value, just start typing. The first key selected will overwrite the first highlighted value on the screen. When the desired value has been keyed in press OK to save the new value.

---

## Bridge Pass / Fail Limits

Bridge Pass/Fail Limits

Low Limit 0.00 lb-in

High Limit 30.00 lb-in

Low Limit: The Torque value that must be exceeded for the test to pass.

High Light: The torque value that must not be exceeded for the test to pass.

## ROPP Screen Page 2

PAGE 2 ROPP TEST SETUP

Name ROPP

**Strip Options**

Peak Detect 5 deg

Cutoff Torque 7.50 lb-in

Speed 1 RPM

Slow Down @ 60 %

**Strip Pass/Fail Limits**

Low Limit 0.00 lb-in

High Limit 30.00 lb-in

**Close Options**

Application Torque 7.50 lb-in

Speed 1 RPM

Slow Down @ 50 %

**Report Options**

Header / Comment

PRIOR PAGE OK CANCEL SET DEFAULTS

The ROPP Test Setup Screen (page 2) is divided into four parts.

Strip Options

Strip Pass / Fail Limits

Close Options

Report Options

## Strip Options

**Strip Options**

Peak Detect 5 deg

Cutoff Torque 7.50 lb-in

Speed 1 RPM

Slow Down @ 60 %

**Peak Detect:** The number of degrees of rotation after a peak has been measured for the software to accept this peak as the strip torque value.

**Cutoff Torque:** The torque at which the test will stop.

**Speed:** The drive speed prior to slow down to 1 RPM test speed.

**Slow Down At:** This is the torque at which the system will change to the speed for performing the test.

## Strip Peak Detect

Strip Peak Detect:

Max Value: 360

Min Value: 2

5 deg

1 2 3 4

5 6 7 8

9 0 . Bk Spc

Cancel Clear Entry OK

**Observe the minimum and maximum values.**

To input a value, just start typing. The first key selected will overwrite the first highlighted value on the screen. When the desired value has been keyed in press OK to save the new value.

## Strip Cutoff Torque

Strip Cutoff Torque:  
Cutoff Torque can not be less than Minimum Torque

Max Value: 30.00  
Min Value: 0.60

7.50 lb-in

1	2	3	4
5	6	7	8
9	0	.	Bk Spc
Cancel	Clear Entry	OK	

**Observe the minimum and maximum values.**

To input a value, just start typing. The first key selected will overwrite the first highlighted value on the screen. When the desired value has been keyed in press OK to save the new value.

## Strip Speed

Strip Speed (prior to 1 RPM Slow Down):

Max Value: 5  
Min Value: 1

1 rpm

1	2	3	4
5	6	7	8
9	0	.	Bk Spc
Cancel	Clear Entry	OK	

**Observe the minimum and maximum values.**

To input a value, just start typing. The first key selected will overwrite the first highlighted value on the screen. When the desired value has been keyed in press OK to save the new value.

## Strip Slow Down At

Strip Slow Down To 1 RPM  
(% of Application Torque):

Max Value: 100  
Min Value: 0

0 %

1	2	3	4
5	6	7	8
9	0	.	Bk Spc
Cancel	Clear Entry	OK	

**Observe the minimum and maximum values.**

To input a value, just start typing. The first key selected will overwrite the first highlighted value on the screen. When the desired value has been keyed in press OK to save the new value.

---

## Strip Pass / Fail Limits

Bridge Pass/Fail Limits

Low Limit  lb-in

High Limit  lb-in

Low Limit: The Torque value that must be exceeded for the test to pass.

High Limit: The torque value that must not be exceeded for the test to pass.

---

## ROPP Cap Test Run Screen

When the ROPP Cap Test has been programmed and selected the run screen, shown below, will be displayed.



# Selecting The System Options

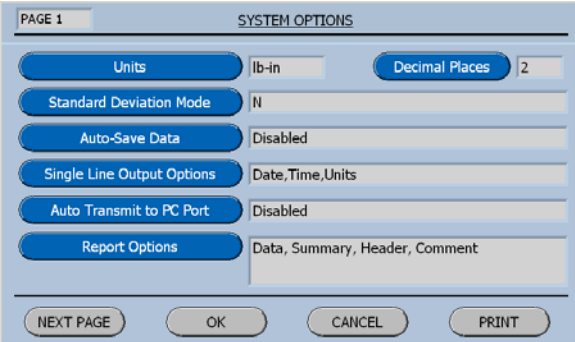
---

## What's Inside

This chapter contains a step-by-step procedure for selecting the system options that best suit the application. System Options are those program features that normally will be selected once, when the system is installed and seldom changed again.

---

## System Options Menu Page 1



The default selections in these option menus have been carefully selected to fit most applications.

### Units of Measure



Pressing the Units Button will step the program through the possible settings, for the current system.

lb-in, lb-ft, Nm, Kg-cm, Ncm, oz-in, mNm.

## Standard Deviation

Standard Deviation Mode

Pressing the Standard Deviation key will toggle the selection from N-1 to N for the calculation ( $\sigma_x$ ). The default selection is N-1.

This formula computes the **mean** value ( $\mu$ ) and the **standard deviation** ( $\sigma_x$ ) of the measured values ( $x_i$ ) for n points.

$$\sigma_x = \sqrt{\frac{1}{n} \sum_{i=0}^{n-1} (x_i - \mu)^2}$$

where  $\mu = \frac{1}{n} \sum_{i=0}^{n-1} x_i$ , and n is the number of elements in  $\mathbf{X}$ .

## Auto Save Data

Auto-Save Data

Pressing the Auto-Save Key will toggle the selection from Disabled to Enabled. The default selection is Disabled.

## Single Line Output Options

Single Line Output Options

This button will display the selection menu for the data that will be sent to the RS-232 port at the end of a test.

The screenshot shows a dialog box titled "SINGLE LINE OUTPUT OPTIONS". It has a light blue background and a thin black border. Inside, there are four rows of options, each with a blue button on the left and a text label on the right. The first row is "Date" with "Enabled" next to it. The second row is "Time" with "Enabled" next to it. The third row is "Units" with "Enabled" next to it. The fourth row is "Direction" with "Disabled" next to it. At the bottom of the dialog, there are two buttons: "OK" on the left and "Cancel" on the right.

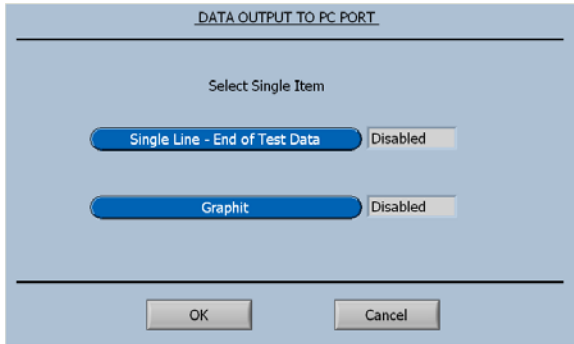
These selections are provided for transmitting to PC programs that may have templates that will already have this information.

Transmitted data will be space delimited.

## Auto Transmit to PC

Auto Transmit to PC Port

Pressing the Auto Transmit Key will display the Data Output to PC menu shown below.



Only one of the two menu items can be enabled at a time.

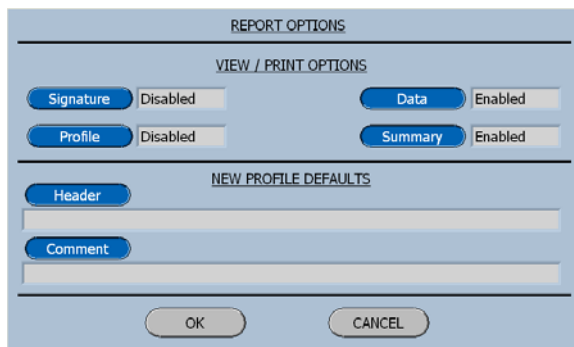
The single line of data is provided for outputting to commercially available SPC programs.

The Graphit selection is used to output data to Vibrac's comprehensive data analysis program.

## Report Options

Report Options

Pressing the Report Options Key will display the Menu shown below.



The Report Options that are selectable on this screen will be described later in the chapter titled **Viewing and Printing Test Results**.

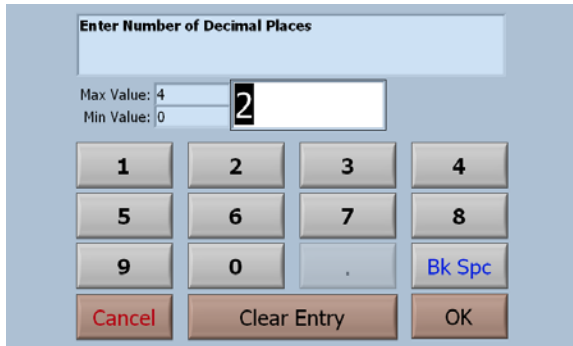
However a feature selected here will now be the default setting for all test profiles.

## Decimal Places

Decimal Places

Pressing the Decimal Place Button will display the input screen for selecting the number of decimal places to be displayed.

## Enter Number of Decimal Places

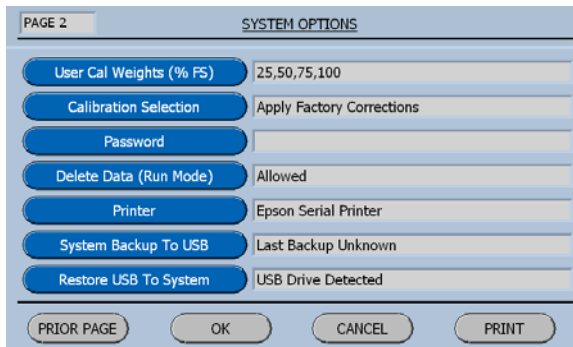


**Observe the minimum and maximum values.**

To input a value, just start typing. The first key selected will overwrite the first highlighted value on the screen. When the desired value has been keyed in press OK to save the new value.

---

## System Options Menu Page 2



As on page 1 the default values have been carefully selected to fit most applications.

## User Cal Weights

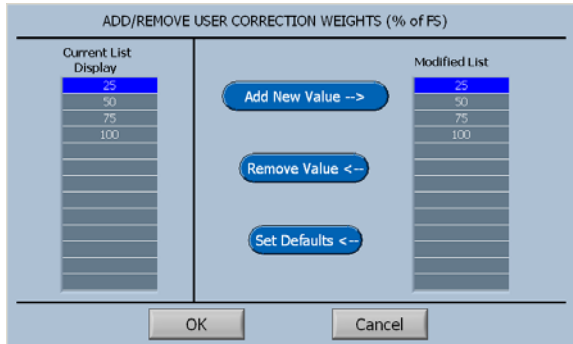
This feature enables the user to add additional weights to the calibration table or use customer-supplied weights.

**User Cal Weights (% FS)**

Pressing the User Cal Weights Button will display the screen for editing the list.



## Add and Remove Weights

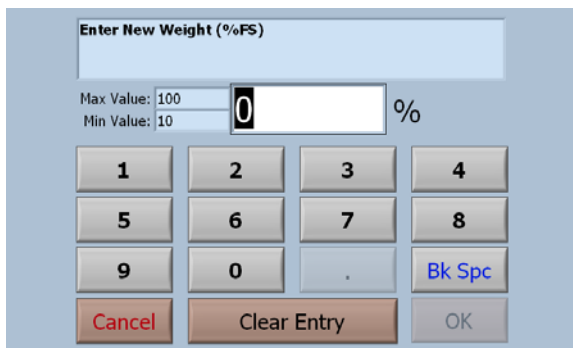


The Add / Remove Screen displays the current list of weights on the left and the new values as they are added or removed on the right.

When the Final list on the right is accepted by selecting OK, the Current List will be updated.

**Add New Value -->**

The Add New Value Button will display the input screen for creating a new value.



**Observe the minimum and maximum values.**

To input a value, just start typing. The first key selected will overwrite the first highlighted value on the screen. When the desired value has been keyed in press OK to save the new value.

**Remove Value <--**

The Remove Value Button will display a confirmation screen to insure that the right value is removed.

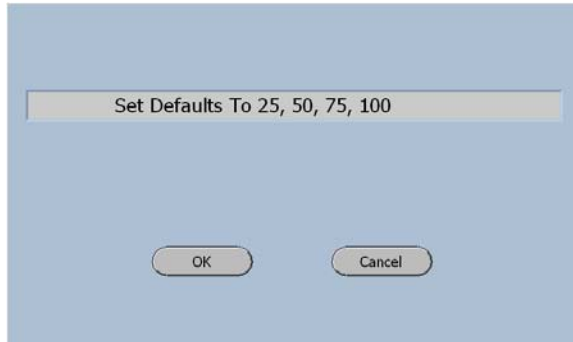


The value that is highlighted in the Final List will be displayed here for confirmation.

The OK key will remove this value.

## Set Defaults <--

The Set Defaults Button will display a confirmation screen to ensure that the right values are being entered.



Vibrac's standard default values are 25%, 50%, 75%, and 100%.

The OK key will accept the displayed values.

## Calibration Selection

### Calibration Selection

The Calibration Selection Button will toggle the software from use Factory Corrections to use User Corrections.

The use of this feature will be described in the chapter titled System Calibration.

## Delete Data

### Delete Data (Run Mode)

Pressing the Delete Data Button will toggle the selection between Enable and Disable. This feature will be described more thoroughly in the chapter titled Viewing and Printing Test Results.

## Printer

### Printer

The Printer select button will toggle the selection between an Epson Serial Printer and the Windows Default Printer.



When the Printer Button is selected the selection screen will toggle between the two printers described above. Please note that the output port will also toggle.

Epson Serial Printer (RS-232)

Windows Default Printer (USB)

## System Backup To USB

System Backup To USB

This feature enables the user to create a backup of all the test profiles that have been created.

This Button is normally grayed out; it turns blue when a USB drive is detected.

## Restore Profiles from USB

Restore USB To Profiles

This feature enables the user to restore profiles to the Library that have been copied to a USB drive.

This Button is normally grayed out; it turns blue when a USB drive is detected.



The chapter titled Using the USB Features will describe in detail how to use the above items.

# Quick Start

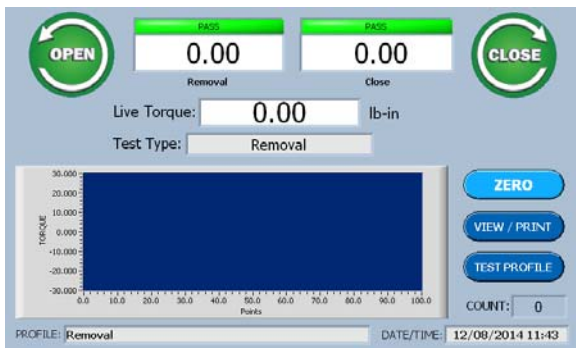
---

## What's Inside

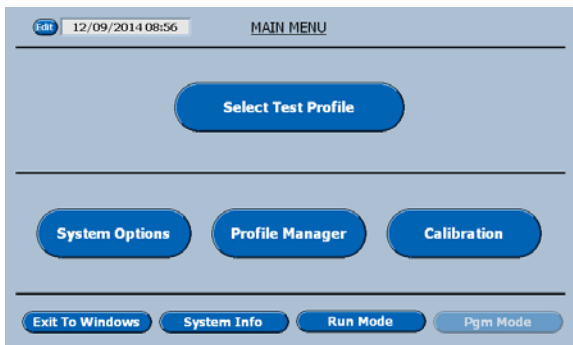
This chapter contains a step-by-step procedure for creating a new profile; with an appropriate name that will measure the removal torque, re-apply the cap and compare the measurements with the programmed pass fail limits when the test is performed.

---

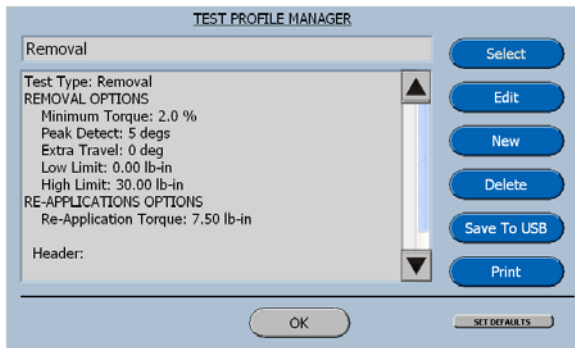
## Creating a New Profile



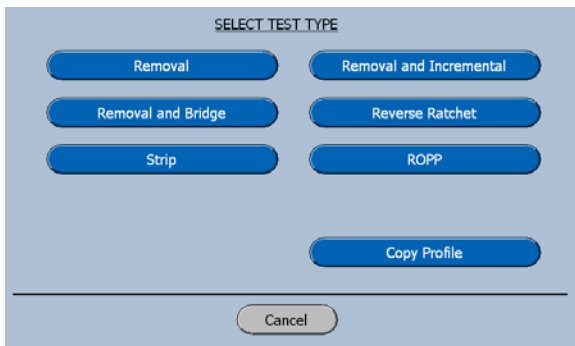
On the Run Screen select Test Profile.



On the Main Menu select Profile Manager.



On the Test Profile Manager screen select New.

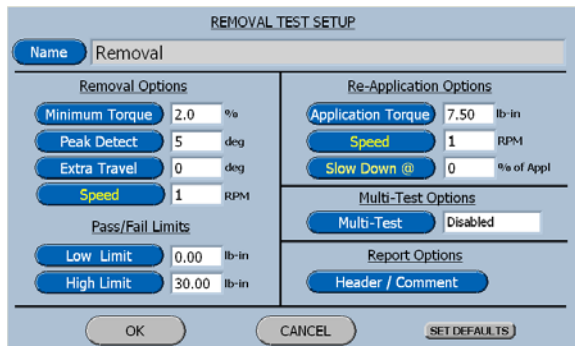


On the Select Test Type screen select Removal.



Enter a name for the test that relates to the product or the specification.

Then press OK.



On the Removal test setup screen select Low Limit.

**Removal Low Pass/Fail Limit:**

Max Value: 30.00  
Min Value: 0.00

5.00 lb-in

1	2	3	4
5	6	7	8
9	0	.	Bk Spc
Cancel	Clear Entry	OK	

Now select Clear Entry and then enter 5.00.  
Press Ok and the software will return to the Removal Test Setup screen.

On the Removal test setup screen select High Limit.

**Removal High Pass/Fail Limit:**

Max Value: 30.00  
Min Value: 5.00

12.00 lb-in

1	2	3	4
5	6	7	8
9	0	.	Bk Spc
Cancel	Clear Entry	OK	

Now select Clear Entry and then enter 12.00  
Press Ok and the software will return to the Removal Test Setup screen.

On the Removal test setup screen select Application Torque.

**Application Torque:**

Max Value: 30.00  
Min Value: 0.00

15.00 lb-in

1	2	3	4
5	6	7	8
9	0	.	Bk Spc
Cancel	Clear Entry	OK	

Now select Clear Entry and then enter 15.00.  
Press Ok and the software will return to the Removal Test Setup screen.

**REMOVAL TEST SETUP**

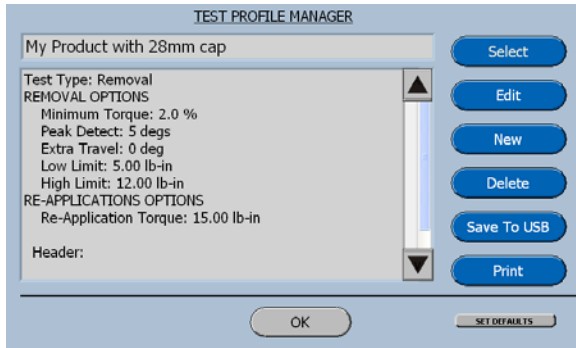
Name: My Product with 28mm cap

<b>Removal Options</b> Minimum Torque: 2.0 % Peak Detect: 5 deg Extra Travel: 0 deg Speed: 1 RPM	<b>Re-Application Options</b> Application Torque: 15.00 lb-in Speed: 1 RPM Slow Down @: 0 % of Appl
<b>Pass/Fail Limits</b> Low Limit: 5.00 lb-in High Limit: 12.00 lb-in	<b>Multi-Test Options</b> Multi-Test: Disabled
<b>Report Options</b> Header / Comment	

OK CANCEL SET DEFAULTS

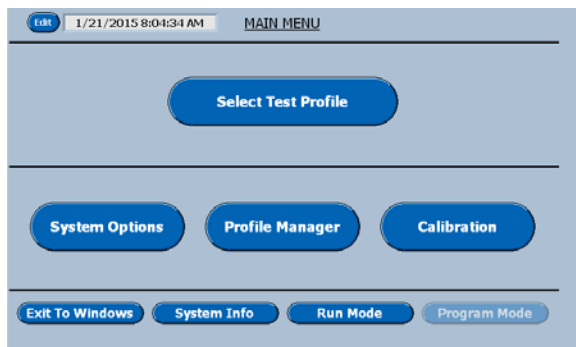
The Removal Test Setup screen now displays the values that have just been entered.

Select Ok and the profile will be saved in memory and software will return to the Test Profile Manager screen.



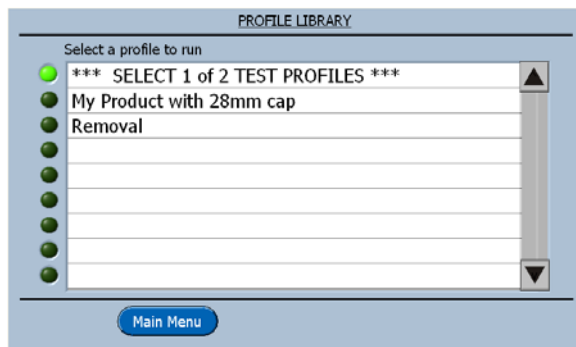
This screen now displays the features that have just been programmed.

Select OK to return to the Main Menu.



On the Main Menu press the Select Test Profile button.

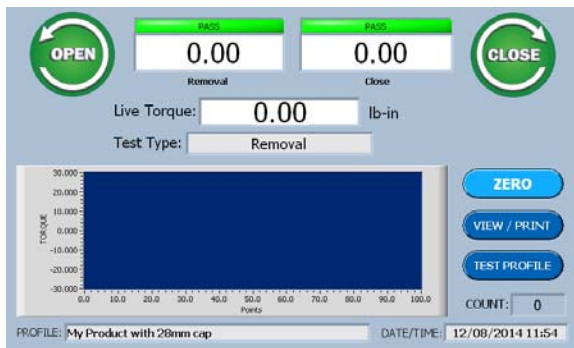
The new profile Library will be displayed.



Now select the new profile My Product with 28mm cap.

The software will now advance to the Run Screen for this profile.

## Performing the Test



The run screen is now displayed.

The name of the selected profile appears at the bottom of this screen and the Test Type appears in the center of the screen just beneath the Live Torque display.



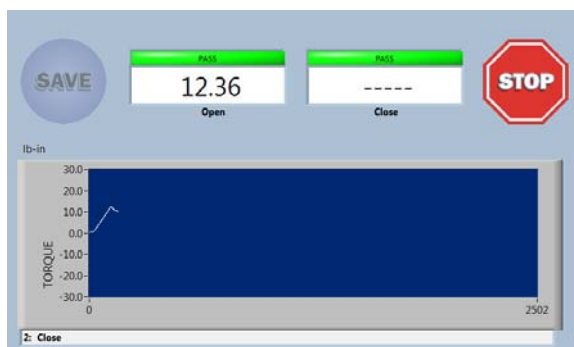
Now with the live torque reading Zero, we can position the sample to be tested in the bottle holding tooling.

Once the bottle has been secured, the drive chuck can be placed on the cap of the sample to be tested.



Pressing the Open button will start the test.

### Live Run Test Screen



This screen is displayed as the test is being performed.

The Stop Button, when pressed, will immediately stop the drive and terminate the test.



# Viewing and Saving Test Results

---

## What's Inside

This chapter contains a description of the procedure for saving test results and then viewing and printing these results.

---

## Saving a Test Result



The end of test screen displays the Removal Torque Value with a color flag of green for pass and red for fail.

The re-application torque is also displayed, however it only has pass / fail limits in the incremental test mode.

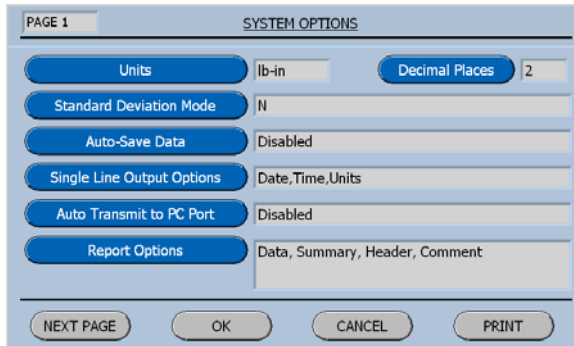


Pressing the Save Button will save the current test data to memory and return the system to the Run Screen.



Pressing the Clear Button will discard the data and return to the system to the Run Screen.

## Auto Save Data



By pressing the Auto Save Data button on the System Option Menu, this feature will be enabled.

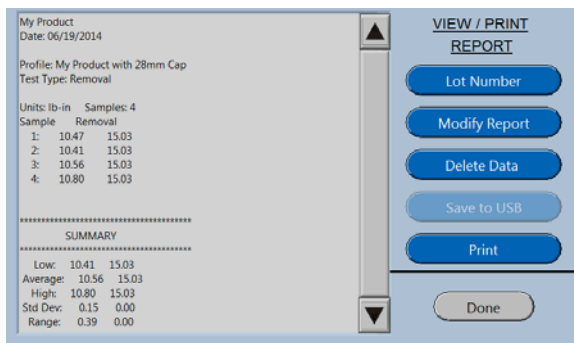
When enabled the data will automatically be saved in memory and then the software will return to the Run Screen.

## Viewing Test Results



On the Run Screen press the View/Print Button and the Test report for the currently selected profile will be displayed.

## View / Print Report



The option keys shown to the right of the report enable the user to customize the report prior to printing.

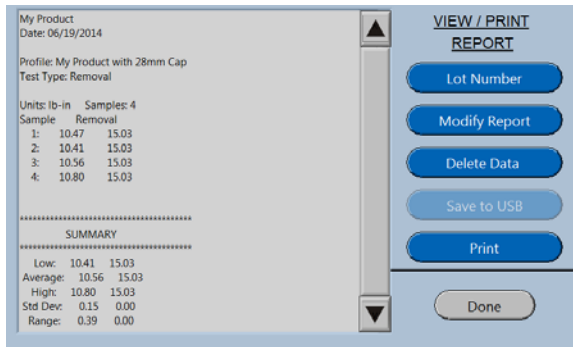
Test Data can also be deleted and corrected prior to printing.

# Modifying Test Reports

---

## What's Inside

This chapter contains a description of the procedure for modifying reports to fit the application.



The customizing features are displayed on the right side of the View / Print Screen.

The features that are selected from this screen will be applied to this report only.

---

## Entering a Lot Number



When the Lot Number button is pressed the following screen will be displayed



Now type in the desired lot number and then select OK.

The number will now be displayed on the report.

---

## Modifying the Report

### Modify Report

When the Modify Report button is pressed the following screen will be displayed.

VIEW / PRINT OPTIONS  
(Changes Will Apply To This View/Print Only)

Signature	Disabled	Data	Enabled
Profile	Disabled	Summary	Enabled
Header			
Comment			

OK CANCEL

The Signature, Profile, Data and Summary Buttons will toggle the selection from disabled to enabled or vice versa.

The Header and Comment Buttons will display the Keyboard for entering the desired terminology.

---

## Deleting Data

### Delete Data

When the Delete Data button is pressed the following screen will be displayed.

Sample # 5

Sample	Units: lb-in	Removal
1:	10.47	15.03
2:	10.41	15.03
3:	10.56	15.03
4:	10.80	15.03
5:	13.25	15.03

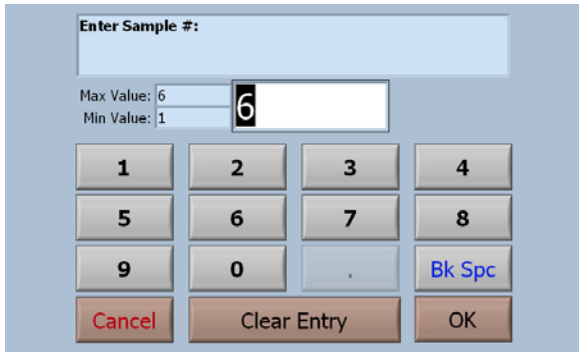
Delete Sample  
Replace Sample  
Delete All  
Done

The delete all button will display a confirmation screen before deleting the data.

The sample button, replace sample button and delete sample button are used for manipulating or correcting an issue with a specific piece of data.

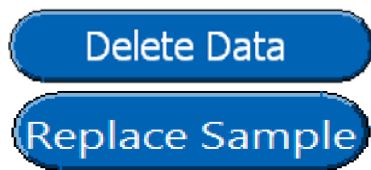
### Sample #

The Sample # Button will display the screen shown below.



### Observe the minimum and maximum values.

To input a value, just start typing. The first key selected will overwrite the first highlighted value on the screen. When the desired value has been keyed in press OK to save the new value.



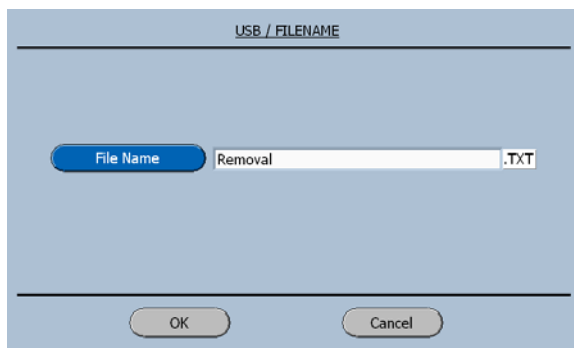
Both of these buttons will display a confirmation screen before executing the desired function.

---

## Saving To USB



When a USB device is detected by the software, the dimmed button will be activated. When selected the following screen will be displayed.



Once a file name has been entered and the OK button selected, the data will be saved in a Note Pad Text File. (TXT)

# Transmitting Test Results

---

## What's Inside

This chapter provides a description of the output port connector requirements, communication protocol and procedure for transmitting test results automatically.

---

## Output Port



The Cap Inspector is supplied with an RS-232 Serial communication port for connecting to a Printer or Personnel computer.

---

## Connector Requirements

The connector is a female, 9 pin Sub-D style (AMP # 7455201-1).

Amphenol = 17-301-1

## Pin Out

02	=	XMIT
03	=	RCV
05	=	GND

---

## Communication Protocol

Data is transmitted in normal ASCII format with the following specifications.

<b>Baud Rate:</b>	9600
<b>Data Bits</b>	8
<b>Stop Bits</b>	1
<b>Parity:</b>	No
<b>Xon / Xoff</b>	Yes

---

## Data Format Information

When transmitting test results the following data strings are used for the different test modes.

### Removal Torque

Date\_Time\_Units\_Torque\_Test Type\_<CR><LF>

Example:

01/01/00\_09:00\_lb-in\_10.80\_removal\_<CR><LF>

## Incremental Torque

Date\_Time\_Units\_Re moval Torque\_Test Type\_Incremental  
Torque<CR><LF>

Example:

01/01/00\_09:00\_lb-in\_10.80\_inc\_12.00<CR><LF>

## Bridge Torque

Date\_Time\_Units\_Re moval Torque\_Test Type\_Bridge  
Torque<CR><LF>

Example:

01/01/00\_09:00\_lb-in\_10.80\_brg\_1.15<CR><LF>

## Reverse Ratchet Torque

Date\_Time\_Units\_Torque\_Test Type\_<CR><LF>

Example:

01/01/00\_09:00\_lb-in\_10.80\_rrt\_<CR><LF>

## Strip Torque

Date\_Time\_Units\_Torque\_Test Type\_<CR><LF>

Example:

01/01/00\_09:00\_lb-in\_10.80\_stp\_<CR><LF>

## ROPP Torque

Date\_Time\_Units\_Re moval Torque\_Test Type\_Bridge  
Torque\_Test Type\_Strip Torque\_<CR><LF>

Example:

01/01/00\_09:00\_lb-in\_10.80\_brg\_1.15 stp\_  
10.90\_<CR><LF>



---

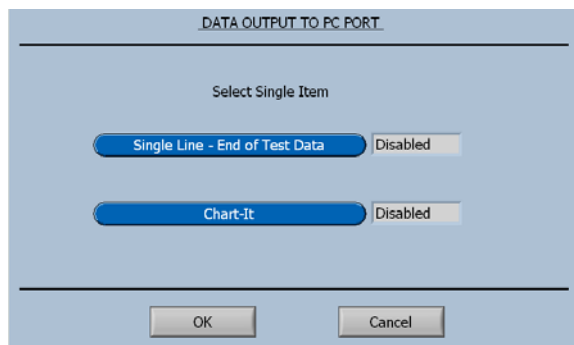
## Transmitting Data Automatically

The Cap Inspector can be programmed to automatically transmit test results at the end of a test or live data during the testing process.

### Transmitting End of Test Results Automatically

Auto Transmit to PC Port

Pressing the Auto Transmit Key on Page 1 of the System Options Menu will display the Data Output to PC menu shown below.



Only one of the two menu items can be enabled at a time.

The single line of data is provided for outputting to commercially available SPC programs.

The Chart-It selection is used to output data to Vibrac's comprehensive data analysis program.

# Using the USB Features

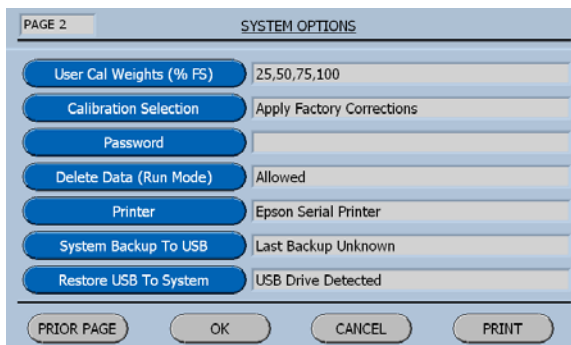
---

## What's Inside

This chapter describes in detail the use of a USB drive to backup the system and to restore profiles.

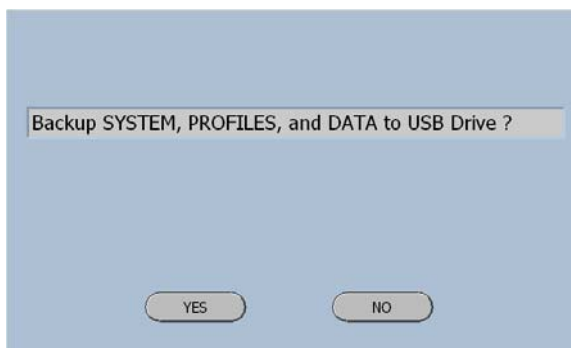
---

## Backing up the System



The backup process begins by first inserting a USB drive into the USB port on the rear panel of the tower. Now go to page 2 of the System Options and select the system Backup button.

The software will display the following information screen.



This screen lists the items that will be backed up when the yes key is selected.

## Copying and Transferring Profiles

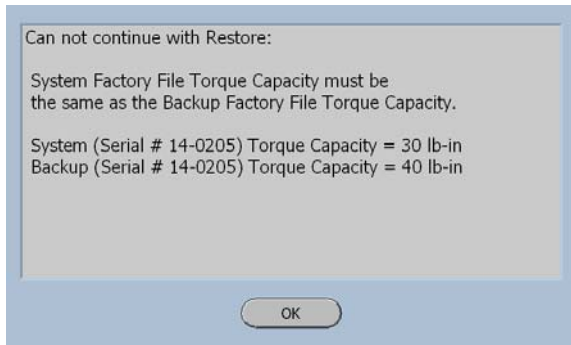


Backing up profiles to a USB drive and then using the Restore feature enables one to transfer the profiles from one machine to another.

---

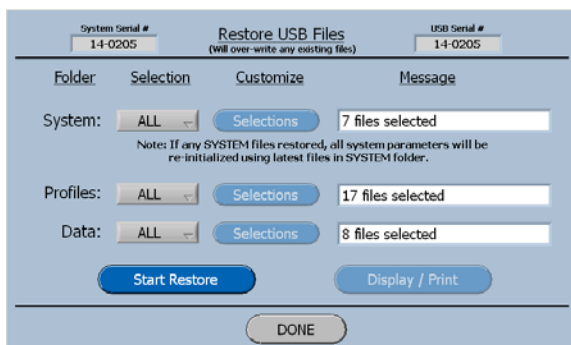
## Restoring USB Files to System

### Restore USB Button



When the Restore Button is selected the software will compare the torque capacity of the current system with the capacity of the system for the stored files and if they are not alike this screen will be displayed.

### Restore USB Screen



When the System Serial # and the USB Serial # do not match, the System Files cannot be restored, however the Profiles and Data can be restored.



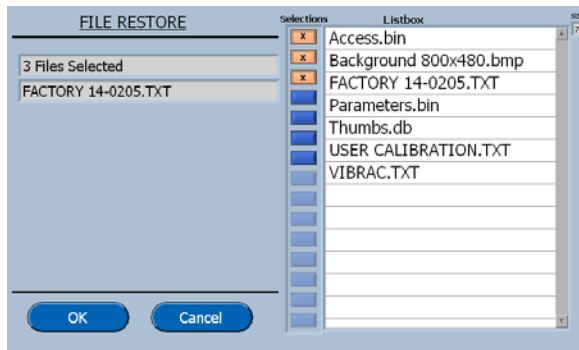
Before selecting the Start Restore Button, make sure the desired files are select. A Restore will over-write any existing files with the same name.

The following procedure will insure that only the desired files are copied.



Select the All button, then change the selection to Custom and the Selection key will be highlighted.

The files for selection will be displayed.



Pressing on the button to the left of the file name will select a file.

This procedure should be followed for all the System Files, Profiles and Data files.



Pressing this button will start the procedure. All of the selected item will be restored.

# Gold Standard Verification

---

## What's Inside

This chapter describes the calibration verification of the Cap Inspector with a Vibrac Gold Standard.

---

## Vibrac Gold Standard Description

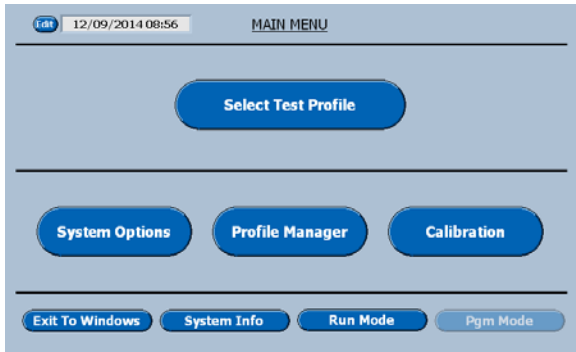


The Model C-2112 Gold Standard Verification Tool is used to quickly verify the calibration and operational repeatability of both the 2000 and 2100 Series Cap Inspectors. These devices are pre-set to a torque value that matches the requirements of the customer.

---

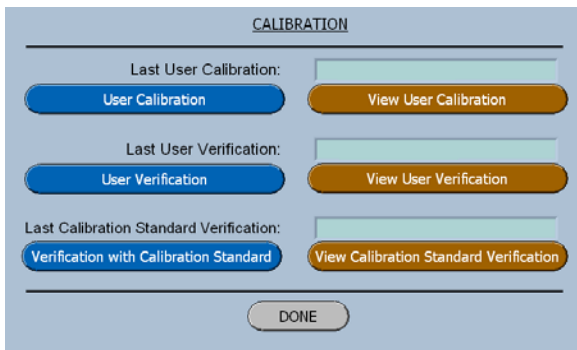
## Calibration Verification with the Gold Standard

The following step-by-step procedure will guide the user through this process.



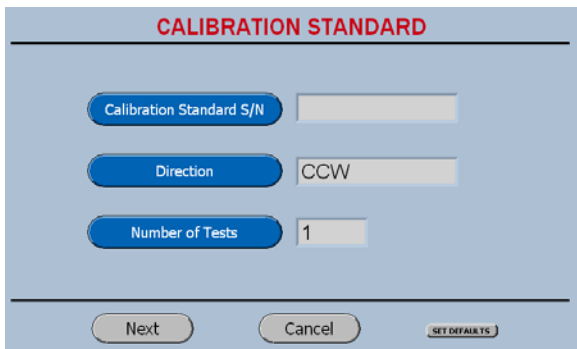
On the Main Menu press the button titled Calibration

The complete Calibration menu will be displayed as shown below.



Now select the Blue Button titled Verification with Calibration Standard.

The software will now advance to the series of menus that will guide the user through the process by just following the steps on the screen.



As a step is selected the appropriate input screen will be displayed.

The direction key acts as a toggle.

The Next key will advance the software to the screen shown below.



It is a good idea to run at least 5 tests. This enables the user to verify the repeatability of the system.



When the torque reads Zero press the continue button.

The software will advance to the Test Screen.



The chuck must now be engaged with the cap on the Calibration Standard.

When the start button is pressed, the Run screen shown below will be displayed.



The measured torque will be displayed graphically and the maximum peak torque will be displayed at the conclusion of the test.

# Cap Inspector Calibration

---

## What's Inside

This chapter describes the entire calibration process, from the initial verification through the performance of a user calibration.

---

## General Calibration Information

A factory Calibration is burned into read-only memory when a system is shipped or serviced by a Vibrac trained individual. This insures the user that there is a full back up available if a faulty user calibration is performed.

### Calibration Frequency



When a system is used on a daily basis, the calibration should be verified at least twice a year.

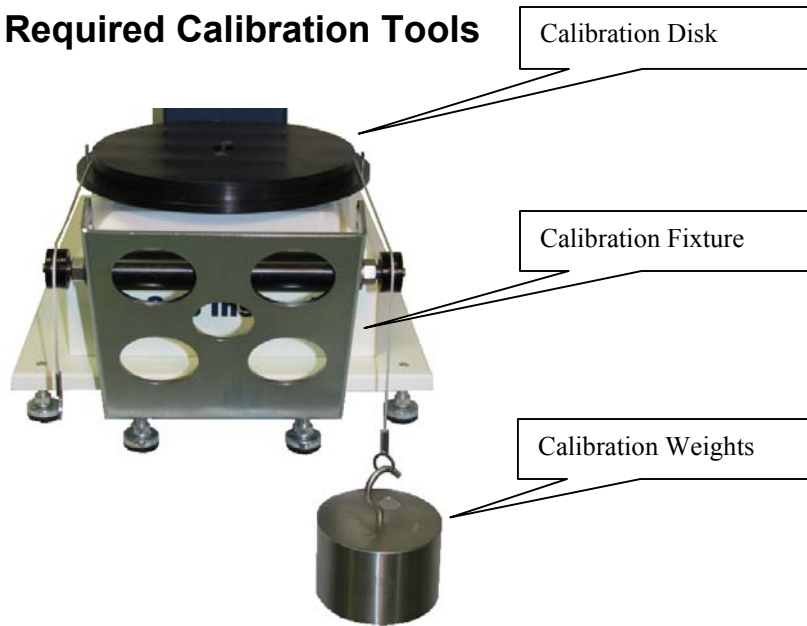
---

## Calibration Equipment

In accordance with ASTM Standard D3474, a round disk, a pulley supporting fixture and a series of weights are required to calibrate torque meters used in the packaging industry.



## Required Calibration Tools



---

## Performing a User Verification

This procedure is used to verify that the system is in calibration.

The first step in this procedure is to install the Calibration Fixture and Calibration Beam on the Cap Inspector.

### Installing the Calibration Fixture

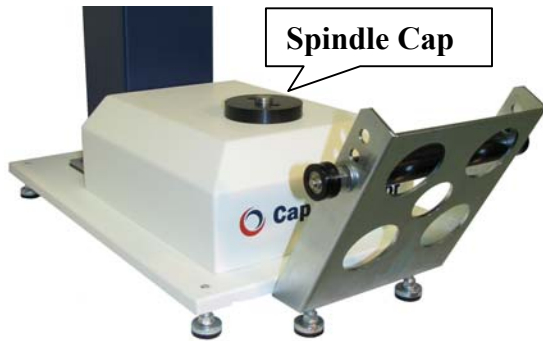


The calibration fixture mounts on the front of the Cap Inspector as shown in the picture.

To install the fixture, loosen the two  $\frac{5}{16}$  Socket Head Cap Screws that are located on the underside of the base plate. Then insert the fixture between the base plate and the head of the screws. Now re-tighten the bolts.

**(Wrench Size  $\frac{1}{4}$  " Hex)**

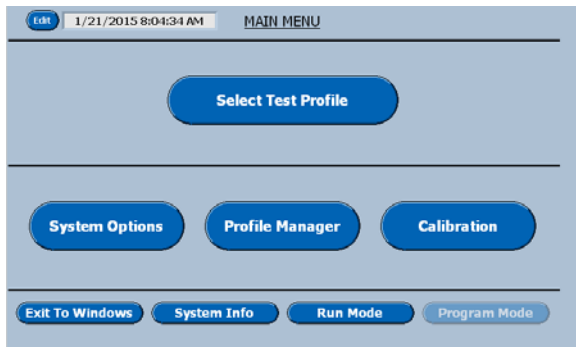
## Installing the Calibration Beam



The beam is installed by first removing any bottle holding tooling and then carefully placing the beam on **top of the spindle cap**. Screws are provided for holding the beam in place.

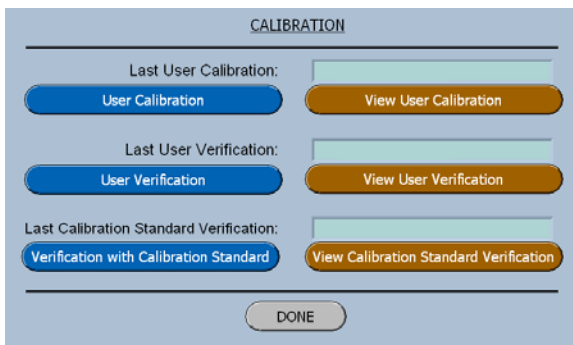
**(2 x .250-20 x 1" Skt Hd Cap Screws)  
(Wrench size  $\frac{3}{16}$  " Hex.)**

The second step in the procedure is to select User Verification on the Calibration Menu.



On the Main Menu press the button titled Calibration

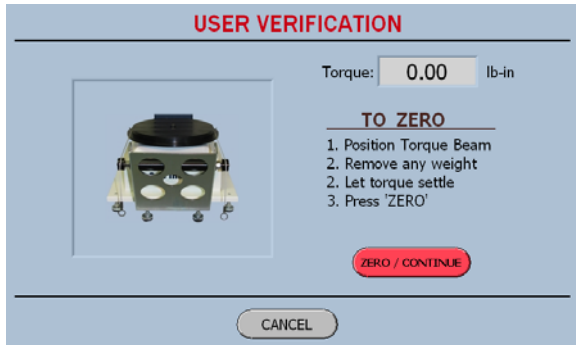
Now the complete Calibration menu will be displayed as shown below.



Now select the Blue Button titled User Verification.

The software will now advance to a series of menus that will guide the user through the process by just following the steps on the screen.

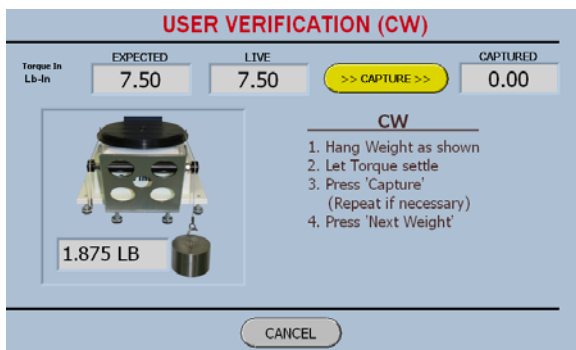
## User Verification Zeroing Screen



The first screen forces the user to Zero the system.

When the Zero Button is pressed, the display will be zeroed and then the software will determine the torque capacity of the system in order to determine the value of the weight to be hung.

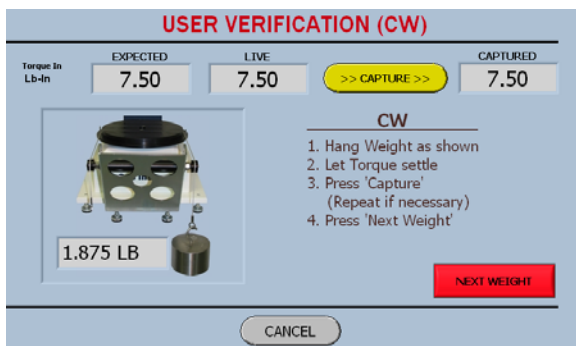
## User Verification Weight 1 Screen



When the weight is applied the live torque will be displayed.

When the torque value stops changing, due to the motion of the weight, the capture button should be pressed and then the following screen will be displayed.

## User Verification Capture 1 Screen



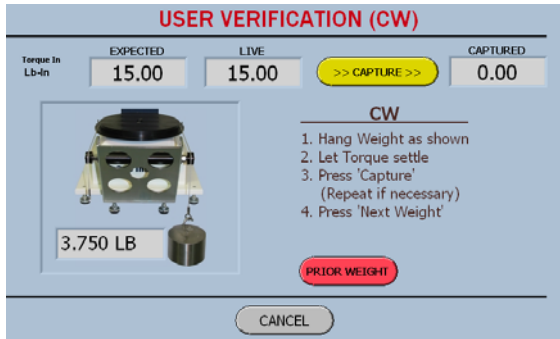
The captured value is now displayed.

It should be the same as the expected value, however if the value is slightly different due to how the process was performed.

(Bumped the table, Bumped the weight)

The Next Weight button will display the following screen from which this problem can be corrected.

## User Verification Weight 2 Screen



The user can return to the previous weight by selecting the Prior Weight button.

If there is no need to return to the prior weight, screen then the displayed weight should be hung.

When the live display settles, the Capture button should be pressed.

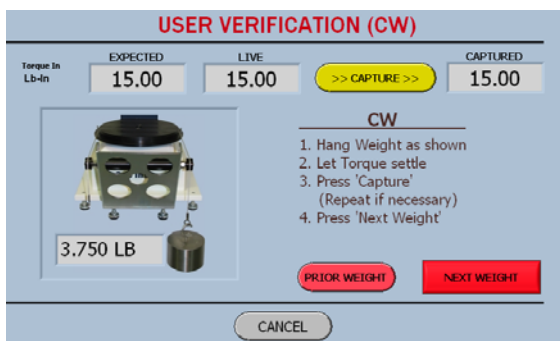


When hanging the weights, the user should try to perform this procedure in a gentle and consistent manner.



If you jump on a scale, the reading will be higher than if you gently step on it.

## User Verification Next Weight Screen



The captured value should be viewed and evaluated as in Screen 2 above.

Once again the Next Weight button will advance the software to the appropriate screen.

Once the torque in both directions of rotation has been verified the following report will be displayed.

## User Verification Report

User Verification

Vibrac Cap Inspector  
Model Number: 2102S-30  
Serial Number: 14-0205

USER VERIFICATION 6/26/2014  
Units: Lb-In

Expected	CW	CCW
7.50	7.50	7.50
15.00	15.00	15.00
22.50	22.50	22.50
30.00	30.00	30.00

Note: Error Tolerance is  
+/- 0.5% of FS (+/- 0.15 Lb-In).  
Value in error marked with "<" .

PRINT DONE



Observe Note on screen. All readings should be within +/- .5 % of Full Scale Torque.

If the readings are not within the tolerance range, a User Calibration should be performed.

---

## Performing a User Calibration

CALIBRATION

Last User Calibration:   
User Calibration View User Calibration

Last User Verification: 6/26/2014  
User Verification View User Verification

Last Calibration Standard Verification:   
Verification with Calibration Standard View Calibration Standard Verification

DONE

Now select the Blue Button titled User Calibration.

The software will now advance to the series of menus that will guide the user through this process, by just following the steps on the screen.

## User Calibration Screen 1



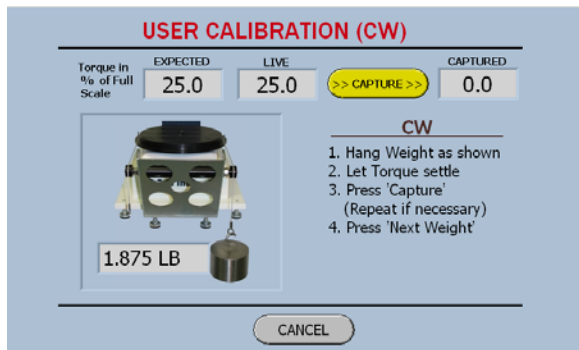
The first Calibration Screen forces the user to Zero the system.

When the Zero Button is pressed, the display will be zeroed and then the software will determine the torque capacity of the system in order to show the value of the weight to be hung.



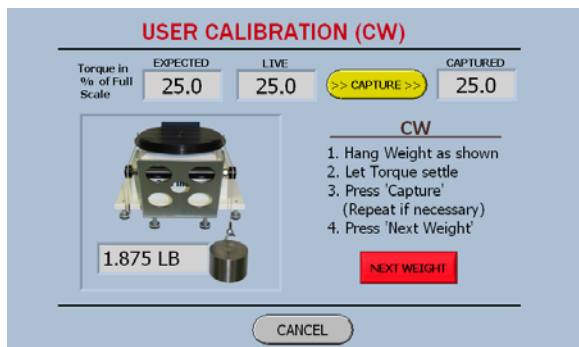
Once again it is very important that the weights be hung carefully and in a consistent manner.

## User Calibration Screen 2



Please note the calibration screens display the torque in Percent of Full Scale not in the default units of measure. This is done because the accuracy of the system is specified as a percent of full scale and the weights are supplied for 25%, 50%, and 75%. Then by combining the 25% with the 75% you have 100 %.

## User Calibration Screen 3



As in the User Verification process the Capture button will except the value and then provide the Next Weight button to advance to the next step.

When all the weight s have been hung and captured the software will display the following screen.

## User Calibration / Verification Screen

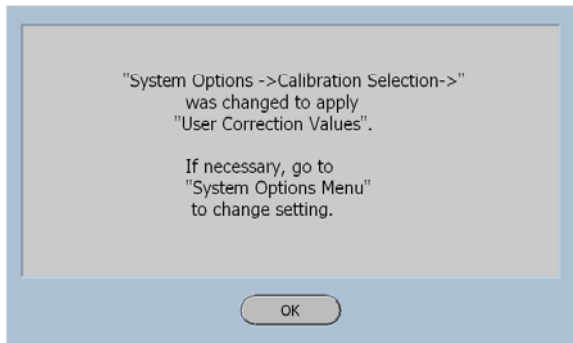


The software will now force the user to perform a Verification to insure that the Calibration was performed properly.

The OK button will now display the User Verification Weight 1 Screen.



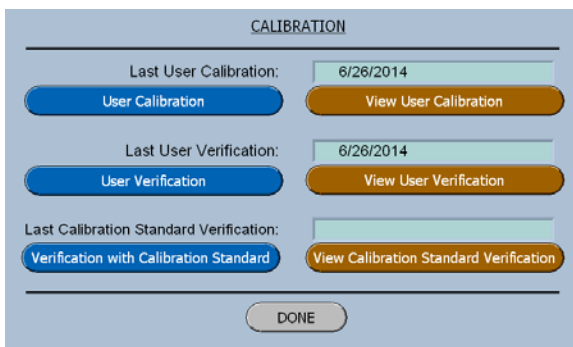
The system does not get re-zeroed between the User Calibration and the User Verification.



This information screen will be displayed at the completion of the User Verification.

Since the Calibration / Verification was performed successfully the software assumes that new Calibration correction values are to be used.

## Main Calibration Menu after Calibration



The Main Calibration menu displays the date of the last Calibration and last Verification.

The view button enables the user to view and print the report for each of these functions.

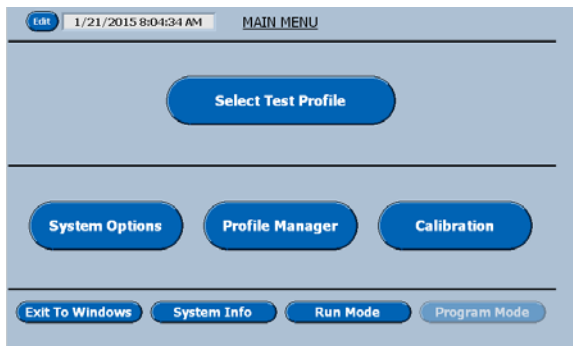
# Setting the Data and Time

---

## What's Inside

This chapter contains a step-by-step procedure for setting the Date and Time.

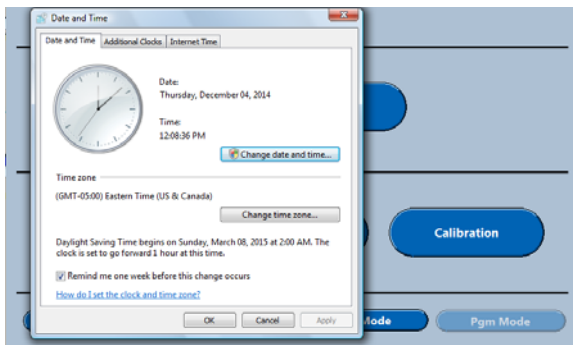
### Edit Date and Time



On the Main Menu Screen in the program mode select Edit next to the Date and Time display in the top left corner.

The following screen will be displayed.

### Date and Time Menu

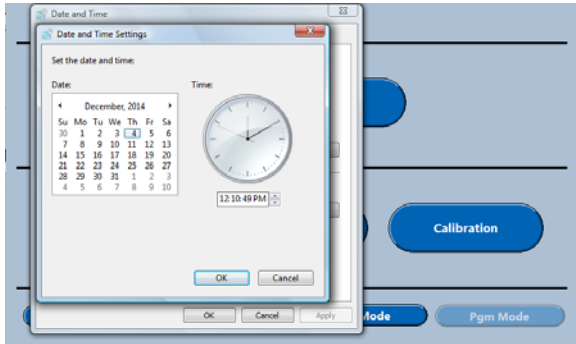


On this menu select Change Date and Time.

The software will now display Edit date and Time screen shown below.



## Edit Date and Time Screen

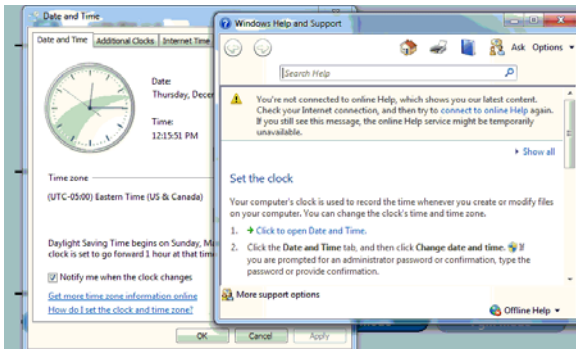


Touching the arrows to the right and left of the displayed month changes the Month.

Touching the desired day changes the Day.

Touching the arrow keys after selecting the value to be changed changes the Time.

## Edit Date and Time Help



When how do I set the clock and time zone is selected, this help screen will be displayed.

# Down Force Option

---

## What's Inside

This chapter describes the Down Force mechanism that is used for testing Child Resistant caps.

---

## About the Child Resistant Option

This option enables the Cap Inspector to provide a pre-settable down force for push and turn caps.

An air supply with the ability to provide a minimum of 60 PSI is required.

Once connected to the air, the down force can be set to the required force for a given application.

---

## Connecting the Air Supply



The air supply connects to the air filter on the rear of the tower.

This connection is a  $\frac{1}{8}$  NPT thread.

Both the air filter and regulator are designed for a maximum of 100 PSI however **the Force Gauge is limited to either 60 or 30 PSI.**

---

## Adjusting the Down Force



Once connected, the Air Control Knob should be adjusted to provide the required amount of down force.

Observe the down force gauge on the front of the tower cover while adjusting the knob.

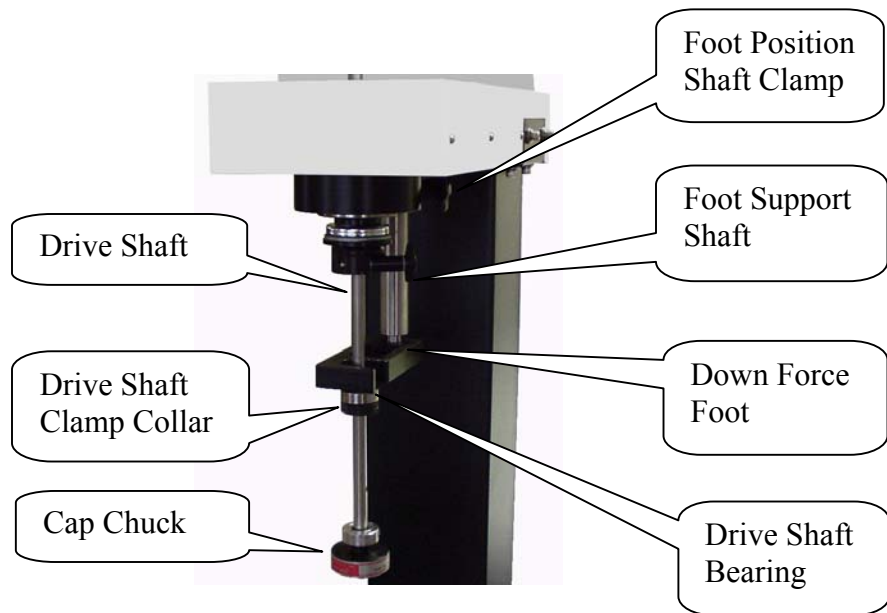


In most cases, a down force of 15 to 20 lbs will open a child resistant closure.

---

## Down Force Mechanism Nomenclature

The names in the callouts below will be used when describing the setup and adjustment of the Child Resistant Down Force Mechanism.



---

## Adjusting the Down Force Foot



The Down Force Foot applies the force on the cap by pressing down on the Drive Shaft Bearing when the Down Force Switch is actuated.

To adjust the foot put the Down Force switch in the up position and then place the sample to be tested in the bottle holding fixture.

Now position the Cap Chuck on the cap by lowering the drive shaft.

Pivot the Down Force Foot over the top of the Drive Shaft Bearing and adjust for approximately 1/16 of an inch of clearance. (i.e. the thickness of a quarter)

Loosening the Foot Position Shaft Clamp and sliding the Foot Support Shaft up or down and then retightening the clamp makes this adjustment.

---

## **Operating the Child Resistant Mechanism**

Once the mechanism has been adjusted, a sample is tested by pivoting the foot into position and actuating the Down Force Switch.

At the conclusion of the test cycle, move the switch to the up position and pivot the foot to the rear.

Repeat this procedure for the next sample.



# Glossary of Terms

## **Bridges**

The small strips of material that span the gap between the cap and the tamper evident band.

## **Incremental Torque**

The force required to rotate a cap to a position 6 degrees past the initial application position in the tightening direction.

## **RS-232**

A serial communication standard for data interchange.

## **Re-application Torque**

The force that will be applied to a cap when re-tightening it.

## **USB**

Universal serial bus interface for connecting peripheral devices to a computer. Sometimes used as short for "USB flash drive".





# Index

## A

About the Child Resistant Option 99  
About This Manual 2  
Add and Remove Weights 66  
Adjusting the Down Force 100  
Adjusting the Down Force Foot 101  
Application Slow Down At 30  
Application Speed Prior to Slow Down 29  
Application Torque 29, 35, 42  
Auto Save Data 63, 75  
Auto Transmit to PC 63

## B

Backing up the System 83  
Bridge Break Speed 40, 57  
Bridge Change Speed 40  
Bridge Change Speed AT 57  
Bridge Distance 39, 56  
Bridge Initial Speed 39, 57  
Bridge Options 39, 56  
Bridge Pass / Fail Limits 40, 58

## C

Calibration Equipment 89  
Calibration Frequency 89  
Calibration Selection 67  
Calibration Verification with the Gold Standard 86  
Cap Inspector Calibration 89  
Chapter 1  
    Unpacking and Inspection 2  
Chapter 10  
    Creating a Reverse Ratchet Test 3  
Chapter 11  
    Creating a Strip Torque Test 3  
Chapter 12  
    Creating an ROPP Test 3  
Chapter 13  
    Selecting the System Options 3

Chapter 14  
    Quick Start 3  
Chapter 15  
    Viewing and Saving Test Results 4  
Chapter 16  
    Modifying Test Reports 4  
Chapter 17  
    Transmitting Test Results 4  
Chapter 18  
    Using The USB Features 4  
Chapter 19  
    Gold Standard Verification 4  
Chapter 2  
    System Power Up 2  
Chapter 20  
    Cap Inspector Calibration 4  
Chapter 21  
    Setting the Date and Time 4  
Chapter 22  
    Down Force Option 4  
Chapter 3  
    System Check 2  
Chapter 4  
    Modes of Operation 2  
Chapter 5  
    Profile Manager 2  
Chapter 6  
    Test Types 2  
Chapter 7  
    Creating a Removal Torque Test 3  
Chapter 8  
    Creating an Incremental Test 3  
Chapter 9  
    Creating a Removal & Bridge Test 3  
Checklist for Items supplied with the system 7  
Close Button 13  
Close Options 35, 42  
Communication Protocol 80  
Connecting the Air Supply 99  
Connector Requirements 79  
Contact Vibrac 19  
Conventions 5  
Copy Profile 23  
Copying and Transferring Profiles 84  
Correcting The Power On Lockup Condition 10  
Creating a New Profile 69  
Creating a Removal & Bridge Test 36  
Creating a Removal Torque Test 25  
Creating a Reverse Ratchet Test 44  
Creating a Strip Torque Test 48  
Creating an Incremental Test 32  
Creating an ROPP CAP Test 53

## D

Data Format Information 80

Date and Time Menu 97  
Decimal Places 64  
Delete Button 21  
Delete Data 67  
Deleting Data 77  
Deleting The Password 18  
Down Force Mechanism Nomenclature 101  
Down Force Option 99

## **E**

Edit Button 21  
Edit Date and Time 97  
Edit Date and Time Screen 98  
Edit Profile Header And Comment 31  
Enter Number of Decimal Places 64  
Enter Password Menu 17  
Entering a Lot Number 76  
Extra Travel 27

## **F**

Forgot Password 19

## **G**

General Calibration Information 89  
Gold Standard Verification 86

## **I**

Incremental Pass / Fail Limits 34  
Initial Display After Power-up 9  
Installing the Calibration Beam 91  
Installing the Calibration Fixture 90  
Introduction 1  
Invalid Password Screen 19

## **K**

Keyboard For Removal and Bridge Test 36  
Keyboard For Removal Test 25  
Keyboard For Reverse Ratchet Test 44  
Keyboard for ROPP Torque Test 53  
Keyboard For Strip Torque Test 48  
Keyboard for the Incremental Test 32

## **L**

Live Run Test Screen 73

## **M**

Main Calibration Menu after Calibration 96  
Modes of Operation 15  
Modifying Test Reports 76

Modifying the Report 77  
Multi-Test Options 30  
Multi-Test Run Options 30

## **N**

New Button 21

## **O**

Open Button 13  
Operating the Child Resistant Mechanism 102  
Output Port 79  
Overview 1

## **P**

Pass / Fail Limits 28  
Password Protecting the System 16  
Performing a User Calibration 94  
Performing a User Verification 90  
Performing the System Check 11, 12  
Performing the Test 73  
Pin Out 80  
Powering Down the Cap Inspector 9  
Powering Up the Cap Inspector 8  
Print 21  
Printer 67  
Profile Library 15  
Profile Manager 20  
Profile Manager Button 20  
Program Mode (Main Menu) 16

## **Q**

Quick Start 69

## **R**

Re-Application Options 29, 40  
Re-Application Slow Down 42  
Re-Application Speed 41  
Re-Application Torque 41  
Removal & Bridge Test Run Screen 43  
Removal & Incremental Test Run Screen 35  
Removal & Incremental Test Setup Screen 33  
Removal and Bridge Test Setup Screens 37  
Removal Minimum Torque 26, 33, 37, 55  
Removal Options 26, 33, 37, 54  
Removal Pass / Fail High Limit 28  
Removal Pass / Fail Limits 34, 38, 56  
Removal Pass / Fail Low Limit 28  
Removal Peak Detect 27, 34, 38, 55  
Removal Speed 27, 38, 55  
Removal Test Run Screen 31  
Removal Test Setup Screen 26

- Report Options 30, 34, 43, 47, 51, 64
- Required Calibration Tools 90
- Restore Profiles from USB 68
- Restore USB Button 84
- Restore USB Screen 84
- Restoring USB Files to System 84
- Reverse Ratchet Direction 46
- Reverse Ratchet Distance 46
- Reverse Ratchet Minimum Torque 45
- Reverse Ratchet Options 45
- Reverse Ratchet Pass / Fail Limits 46
- Reverse Ratchet Speed 46
- Reverse Ratchet Test Run Screen 47
- Reverse Ratchet Test Setup Screen 45
- ROPP Cap Test Run Screen 60
- ROPP Screen Page 1 54
- ROPP Screen Page 2 54
- ROPP Test Setup Screens 54
- ROPP Torque 81
- Run Mode (Main Menu) 15
- Run Screen 11

## **S**

- Save to USB 21
- Saving a Test Result 74
- Saving To USB 78
- Select Button 21
- Select Test Type 23, 25, 32, 36, 44, 48, 53
- Selecting a Mode 15
- Selecting a Profile from the Library 9
- Selecting The System Options 61
- Setting the Data and Time 97
- Standard Deviation 62
- Strip Cutoff Torque 50, 59
- Strip Minimum Torque 49
- Strip Options 58
- Strip Pass / Fail Limit 51
- Strip Pass / Fail Limits 60
- Strip Peak Detect 50, 59
- Strip Slow Down At 51, 60
- Strip Speed 50, 59
- Strip Test Options 49
- Strip Test Run Screen 52
- Strip Test Setup Screen 49
- Strip Torque 81
- System Backup To USB 68
- System Check 11
- System Options Menu Page 1 62
- System Options Menu Page 2 65
- System Power Up and Down 8

## **T**

- Test Definitions 24
- Test Profile Manager Screen 20

- Test Types 22
- Transmitting Data Automatically 82
- Transmitting End of Test Results Automatically 82
- Transmitting Test Results 79

## **U**

- Units of Measure 62
- Unpacking And Inspection 6
- User Cal Weights 65
- User Calibration / Verification Screen 96
- User Calibration Screen 1 95
- User Calibration Screen 2 95
- User Calibration Screen 3 95
- User Verification Capture 1 Screen 92
- User Verification Next Weight Screen 93
- User Verification Report 94
- User Verification Weight 1 Screen 92
- User Verification Weight 2 Screen 93
- User Verification Zeroing Screen 92
- Using the USB Features 83

## **V**

- Vibrac Gold Standard Description 86
- View / Print Report 75
- Viewing and Saving Test Results 74
- Viewing Test Results 75

## **W**

- Wait 30 Seconds 10
- What's Inside 1, 6, 8, 11, 15, 20, 22, 25, 32, 36, 44, 48, 53, 61, 69, 74, 76, 79, 83, 86, 89, 97, 99

## **Z**

- Zero Instruction Screen 12
- Zeroing the System 12