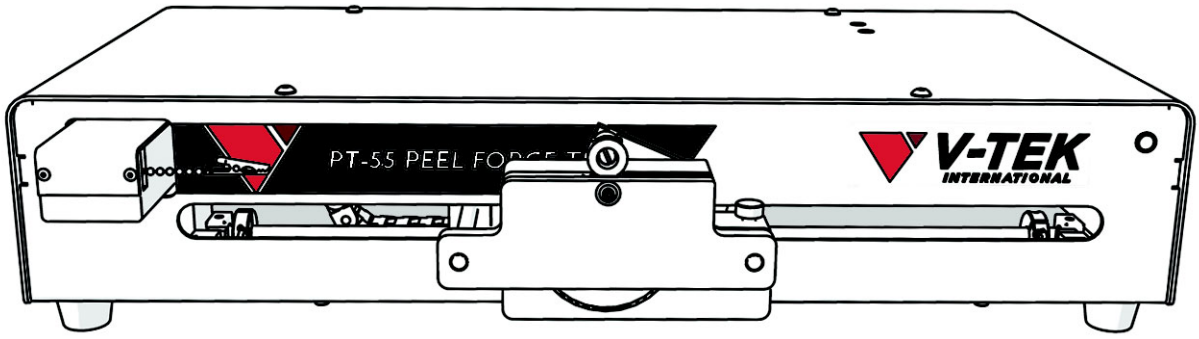
V-TEK INTERNATIONAL



PT-55

SMD Tape Peel Force Tester
User's Guide

V-TEK, Inc.
751 Summit Avenue
Mankato, MN 56001
(P) 507-387-2039
www.vtekusa.com

User's Guide # D291308.AI

EC Declaration of Conformity

Manufacturers Name: V-TEK Inc.
Manufacturers' Address: 751 Summit Avenue
Mankato, MN 56001 USA

Declare that the machinery described below complies with applicable health and safety requirements of Part 1 of Annex 1 of the Machinery Directive 2006/42/EC and EMC Directive 2004/108/EC. Confidential technical documentation has been compiled in accordance with Part A of Annex VII of Machinery Directive 2006/42/EC and is available to European national authorities on written request only. If a request is received documentation will be delivered on a CD or by post.

Description: Tape Peel Force Tester
Model Number: PT 55
Specification: Load measuring range and sizes of sealed carrier tape.
Serial Number/s: 2016000235

The following standards have either been referred to or been complied with in part or in full as relevant:

EN ISO 12100:2010	Safety of machinery	-	Safety of machinery - General principles for design - Risk assessment and risk reduction
EN ISO 13849-1:2008	Safety of machinery	-	Safety Related Parts of Control Systems – Part 1 General Principals for Design
EN ISO 13732-1:2008	Safety of machinery	-	Ergonomics of the thermal environment - Methods for the assessment of human responses to contact with surfaces
EN 614-1:2006+A1:2009	Safety of machinery	-	Ergonomic design principles - Part 1: Terminology and general principles
EN 614-2:2000+A1:2008	Safety of machinery	-	Ergonomic design principles - Part 2: Interactions between the design of machinery and work tasks
EN 953:1997+A1:2009	Machinery Safety	-	General requirements for the design and construction of guards
EN 13850: 2008	Safety of machinery	-	Emergency-stop equipment, Principals for Design
EN 60204-1:2006/A1:2009	Safety of machinery	-	Electrical Equipment of Machines
EN ISO 11202/A1 1997	Acoustics	-	Noise emitted by machinery and equipment - Determination of emission sound pressure levels at a work station and at other specified positions.
EN 61000-6-3:2007	EMC	-	Generic standards - Emission standard for residential, commercial and light-industrial environments
EN 61000-6-1: 2007	EMC	-	Generic standards - Immunity for residential, commercial and light-industrial environments

Full Name of responsible person and place of signing

Christina Hogan

Place V-TEK Inc. **Position** Vice President

Signature **Date** 07/15/2013

EC REP
QNET BV
Hommerterweg 286
6436 AM Amstenrade
The Netherlands

Preface

The PT-55 SMD Peel Force Tester is built with the following features:

- Optional Windows 7/XP laptop with security bracket and software for controls
- Automated home and calibration positioning
- USB communications interface
- Easy design allows operator calibration in minutes
- Standard EIA peel speed (microprocessor controlled)
- Handles all tape widths from 8mm to 120mm and 35.5mm pocket depth
- Measures in grams or newtons
- Customizable data fields
- A sampling rate of 550 times a second

The intended use of the PT-55 SMD Peel Force Tester is to measure the peel force of sealed SMD tape. Use of this equipment in any other way is not recommended.

This Operator's Manual describes how to setup and operate the PT-55 SMD Peel Force Tester. It should be read and thoroughly understood before operating the machine.

Theory of Operation

Operation of the PT-55 is simple. The operator enters customer/tape data and peel force settings into the PT-55 software. A sealed tape sample with a small portion of cover tape peeled back is loaded into the adjustable carriage track between the idler wheel and the sprocket wheel. The tape must be positioned so the sprocket holes of the tape placed over the pins of the sprocket wheel.

The operator attaches an alligator clip from the load cell chain to the edge of the loose cover tape. The test is begun by pressing the **Start** button on the HMI.

During the test, results are displayed on the computer HMI. Upon completion a **PASS** or **FAIL** message will appear on HMI. The completed pull test may be saved or printed or reset to run a second sample.

Machine Details

Operating Temperature
0 Degrees Celsius to + 60 Degrees Celsius

Although all of the components used on the machine will withstand the temperature range of 0 degrees Celsius to +60 degrees Celsius, such temperature may decrease the life of some of the components. The recommended rating is 0 degrees Celsius to +50 degrees Celsius.

Humidity
5% to 90% non-condensing

Physical Specifications
Height: 5 inches (13 cm)

Width: 22 inches (56 cm)

Depth: 10 inches (25 cm)

Weight: 22 pounds (10 kg)

Power Required
- 120/230 VAC, 50-60 Hz

Intended Use

The intended use of the PT-55 SMD Peel Force Tester is to measure the peel force of sealed SMD tape. Use of this equipment in any other way is not recommended.

Operating Environment

The PT-55 is designed to be operated in a temperature controlled, light, industrial setting. The machine should be installed on a flat, dry, stable surface in a well lit area (ambient lighting of 200 to 300 Lux (Lumens/m2).

The recommended climate is between 5 - 90% non-condensing humidity with a room temperature between 0 - 50 degrees Celsius.

> **Note**: Although all of the components used on the machine will withstand the temperature range of 0 to 60 degrees Celsius, such temperature may decrease the life of some of the components.

The intended electrical environment is Pollution Degree 2 and Over Voltage Category II.

Misuse

The user is protected from moving parts and exposure to objects being ejected under pressure by metal enclosures. The PT-55 should never be operated with these enclosures removed.

General Precautions

Only qualified personnel with the proper technical training, experience working on this type of equipment, and awareness of the possible hazards should perform maintenance on the PT-55.

The PT-55 should be installed on a level and stable surface before any operation or maintenance is performed.

This manual should be read and thoroughly understood before operating the machine.The guidelines provided in the following pages are intended to educate the user about how to operate the PT-55 safely. They contain important information on avoiding potential hazards to the operator and to the equipment.

Safety Precautions

Observe the following safety precautions when working with the PT-55.

Maintenance

Please refer to Chapter 3 of this manual before performing maintenance on the machine.

Top Cover

Dangerous voltage is present. When performing maintenance, always disconnect the power source from the machine before removing access panels.

Contact Information

V-TEK, Inc.
751 Summit Ave
Mankato, MN 56001
TEL: (507) 387-2039
website: http://www.vtekusa.com

For customer service, please refer to the Customer Service Contact Sheet at the back of this manual.

PT-55
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Table of Contents (continued)

Chapter 1: Machine Overview

Contents

Machine Overview

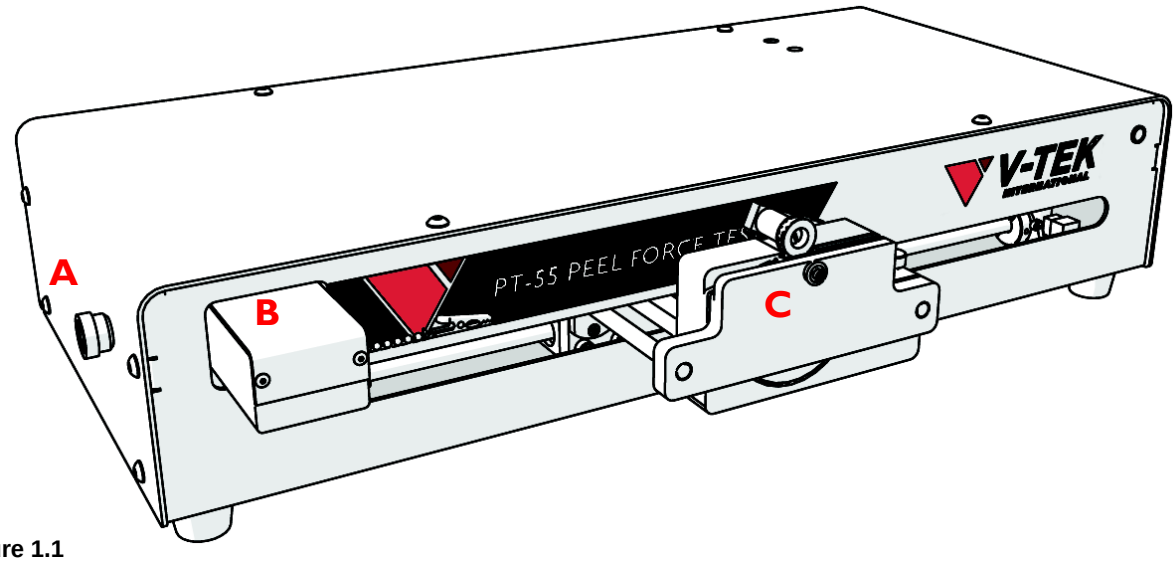


Figure 1.1

A. Load Cell Position Screw

Loosening this screw will allow positioning of the load cell assembly. Once the load cell is aligned with the tape to be tested, tighten the screw to maintain the load cell position.

B. Load Cell

The load cell is a pressure transducer which converts the mechanical peel force into an electrical signal. It can be repositioned so it aligns with the center of the tape being tested. It is connected to the cover tape by an alligator clip. The alligator clip is attached to the cover tape while the carrier tape is connected to the carriage assembly.The cover tape remains stationary as the carriage and carrier tape move away from the load cell. The amount of force applied to the cover tape as the two separate is transferred from the alligator clip, through the chain, to the load cell.

C. Carriage Assembly

The carrier tape is attached to the motorized carriage assembly when taking a peel force reading. The main components of the assembly are the motor and drive gear, tape sprocket, idler wheel, and the tape guide. The motor and drive gear move the assembly along the linear track when a test is started. The sprocket holes along the edge of the carrier tape are placed on the teeth of the tape sprocket. This tape sprocket advances the carrier tape through the assembly as the assembly moves forward. The idler wheel holds the carrier tape in place on the tape sprocket. The tape guide holds the carrier tape at the proper angle for a 170-180 degree pullback.

Note: The PT-55 is shipped with a carriage clamp attached to the carriage assembly to prevent carriage movement during shipment. The carriage clamp must be removed before operating the PT-55

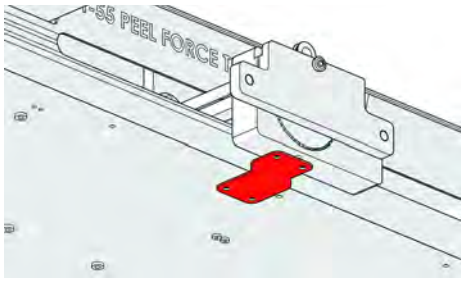


Figure 1.2

Rear Panel

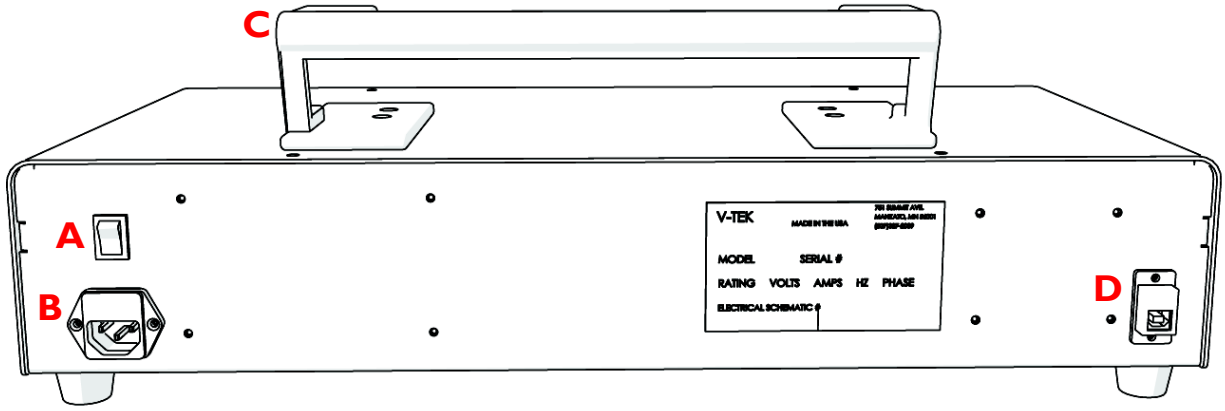


Figure 1.3

A. Power Switch
ON/OFF switch for the PT-55.

B. AC Receptacle
AC power supply plug.

C. (Optional) Security Bracket
Security bracket used for securing the laptop to the PT-55.

D. USB Port
Connector for connecting the PT-55 to a PC.

Load Cell Details

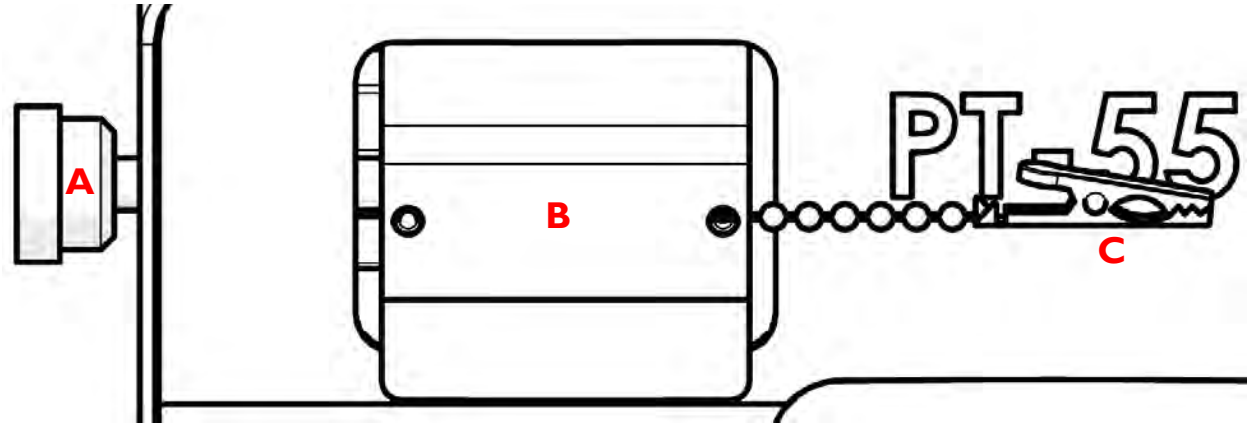


Figure 1.4

A. Load Cell Position Screw

B. Load Cell

C. Alligator Clip

Carriage Assembly Details

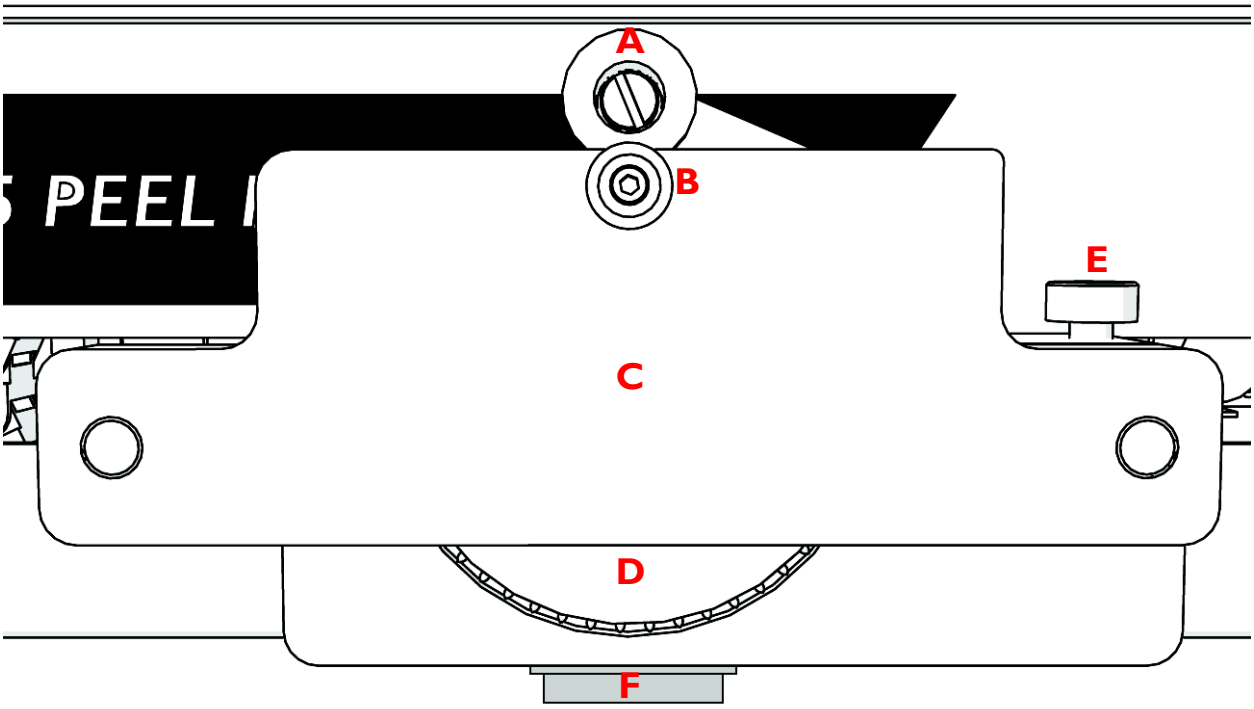


Figure 1.5

A. Idler Wheel

B. Calibration Jig

C. Carriage Front Track Guide

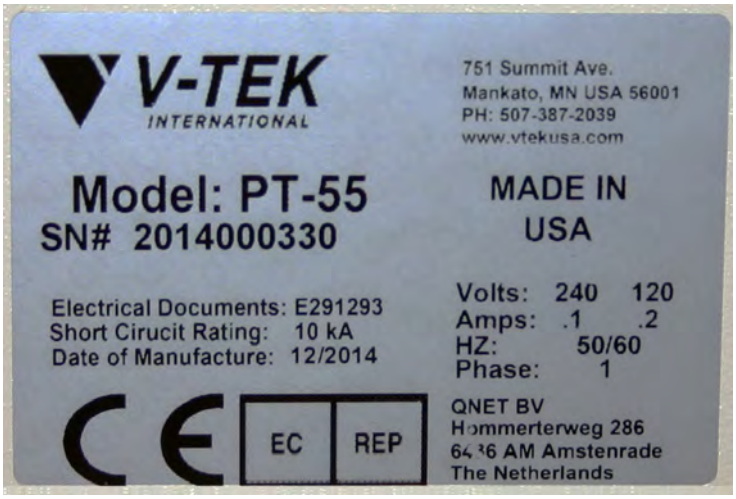
D. Sprocket Wheel

E. Track Adjustment Knob

F. Carriage Clamp (remove before operation)

Serial Plate

The PT-55 Serial plate contains critical machine information including Electrical details, documentation and ratings; model, manufacture date and serial number; and contact information for V-TEK Inc. and the EC Rep for this machine.

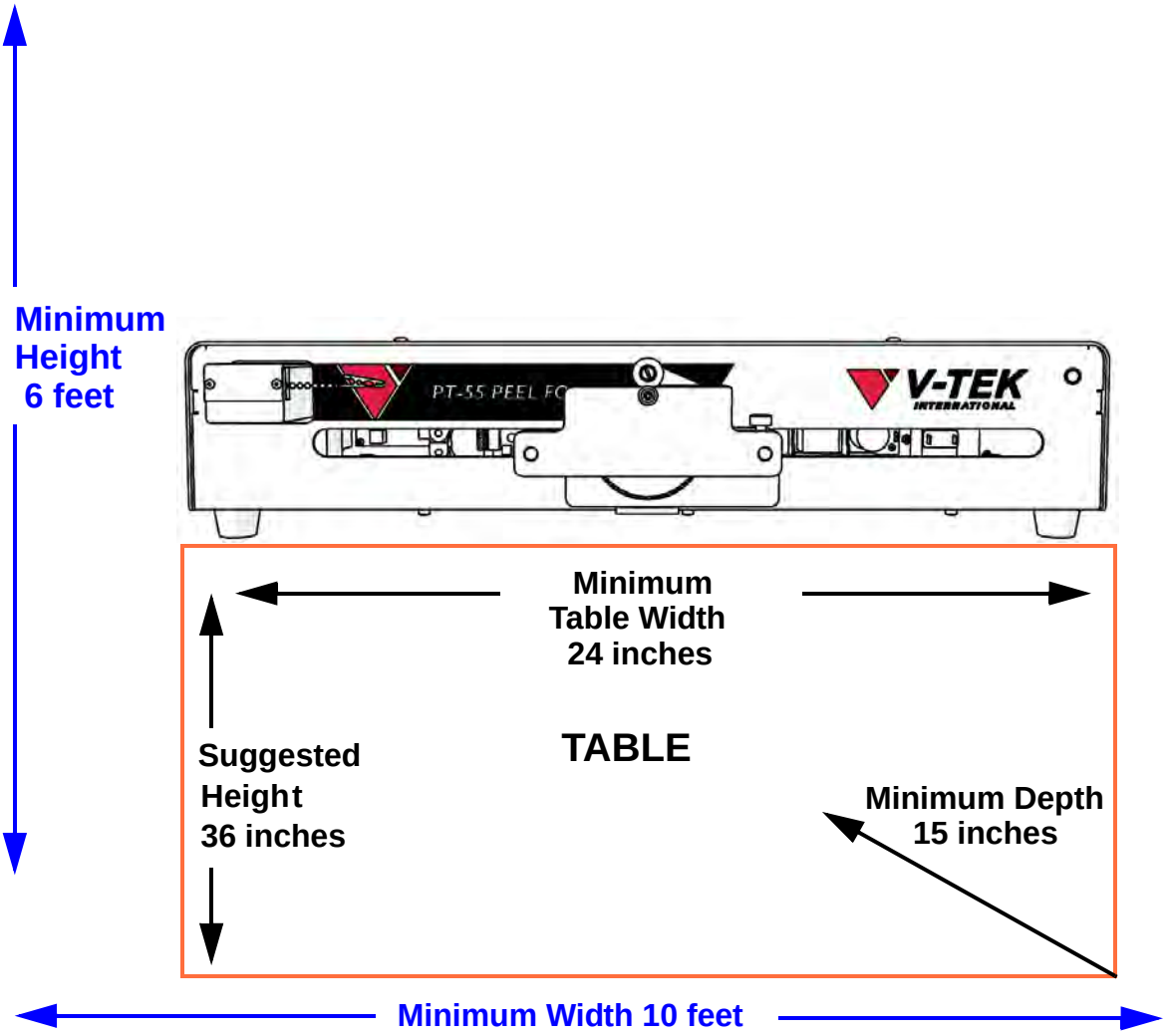


Chapter 2: Setup

Contents

Preparing the Work Area

The PT-55 is a table-top machine which needs to be placed on a flat, stable surface in a well lit area that is a minimum of 6' high x 6' wide x 3'deep (2m x 2m x 1m). When positioning the PT-55, choose an area that is not located below overhead gantries, walkways or power lines to ensure objects or liquids cannot be dropped on the machine from overhead.



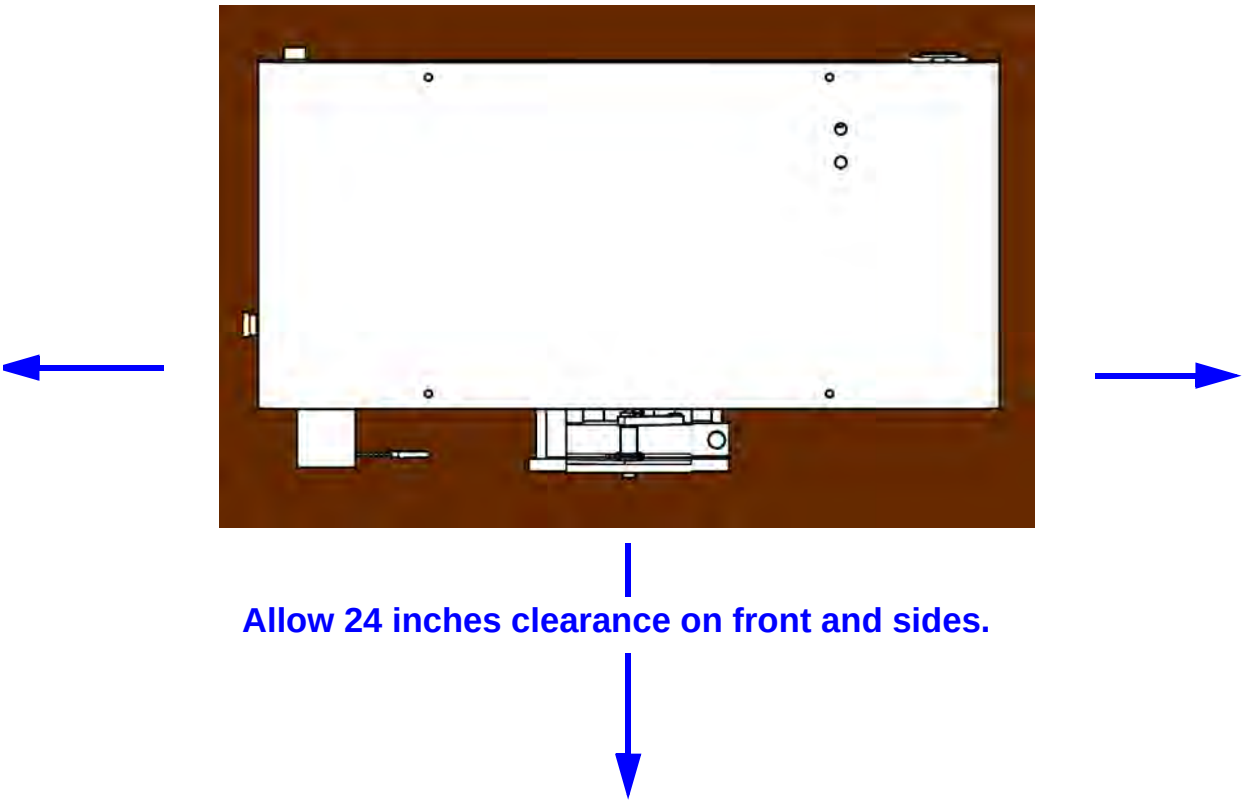
Choose a table that is at least 24" wide by 15" deep to provide sufficient space for the assembled machine.

Ideally the table height should be adjustable so the machine height can be easily adjusted to suit operators of varying heights. The objective is to position the PT-55 controls so they are easily accessible for operation and maintenance. The suggested level is 36" (900 mm) above the floor, but this may vary from one operator to another.

The table's working surface should have a slope of no more than 5 degrees and be capable of supporting a load of 25 pounds (11 kg).

When loading, unloading or running the PT-55, the operator should stand in front of the machine controller to assure easy access to all controls. This position also allows the operator to view all parts of the PT-55 while it is in operation.

Allow at least 24” clearance at the front and sides of the machine for easy access and operation. (Pictured in the overhead view below.)



The PT-55 will also require access to a 120/230 VAC, 50-60 Hz power supply. Locate the machine so electrical power cables can be routed away from areas where personnel are expected to move. It is recommended that cables be routed overhead or underground. If cables must be routed over the floor, cover them with rubber ramps.

Assembly Instructions

System Requirements

Hardware:

At minimum, a computer with a 1 GHz Processor, 512 MB of RAM, a 2 GB Hard Drive and a VGA 800 X 600 capable display.

Software:

The PT-55 HMI will work on a PC running Windows 7 Pro or Windows 10 Pro.

> **Note:** If the computer has issues starting up when the USB ports are in use, see the *Appendix* at the end of this manual for BIOS change instructions.

Laptop Security Bracket Installation

> **Note**: The PT-55 should be **OFF** and disconnected from any power source while following these instructions.

1. Remove the (12) 10-32 BHCS (in blue below) around the top and sides of the PT-55.

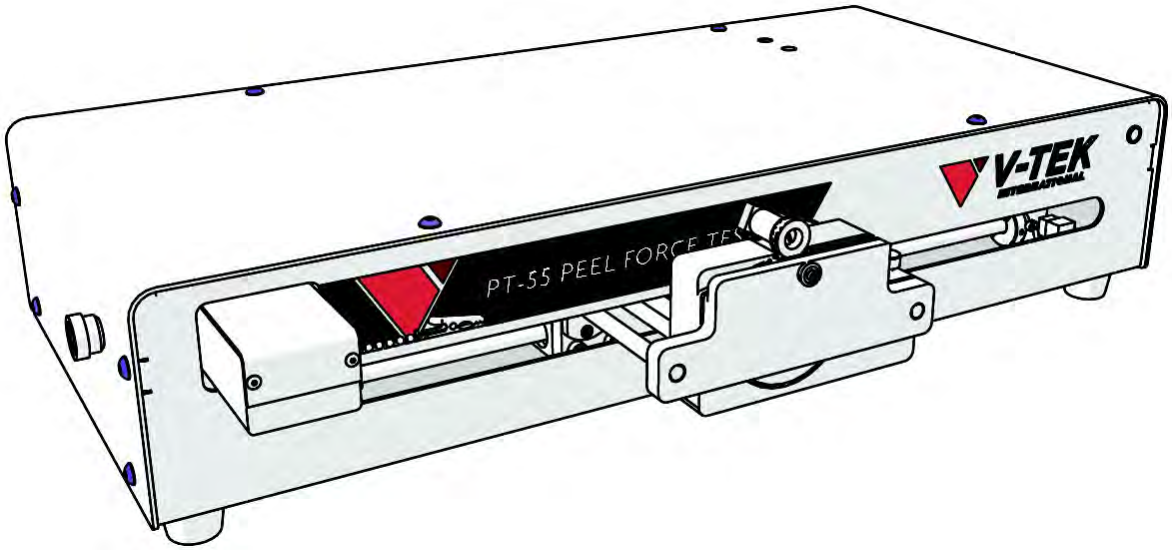


Figure 2.1

2. Remove the thumb screw on the left side of the machine..

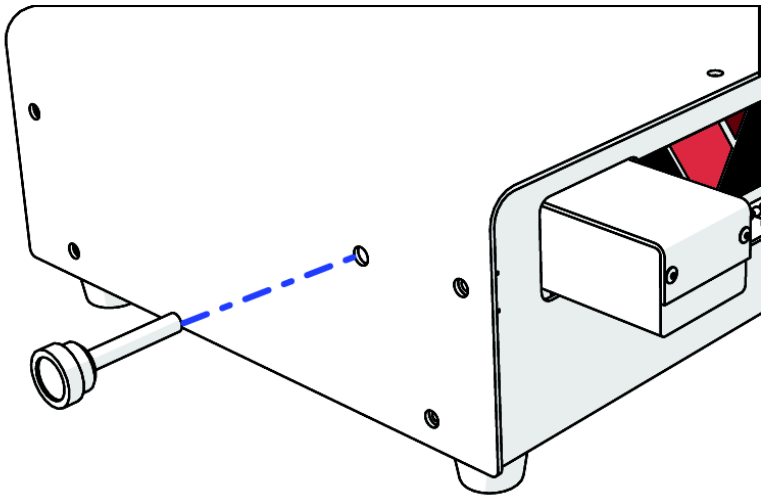


Figure 2.2

3. Lift off the top of the PT-55..

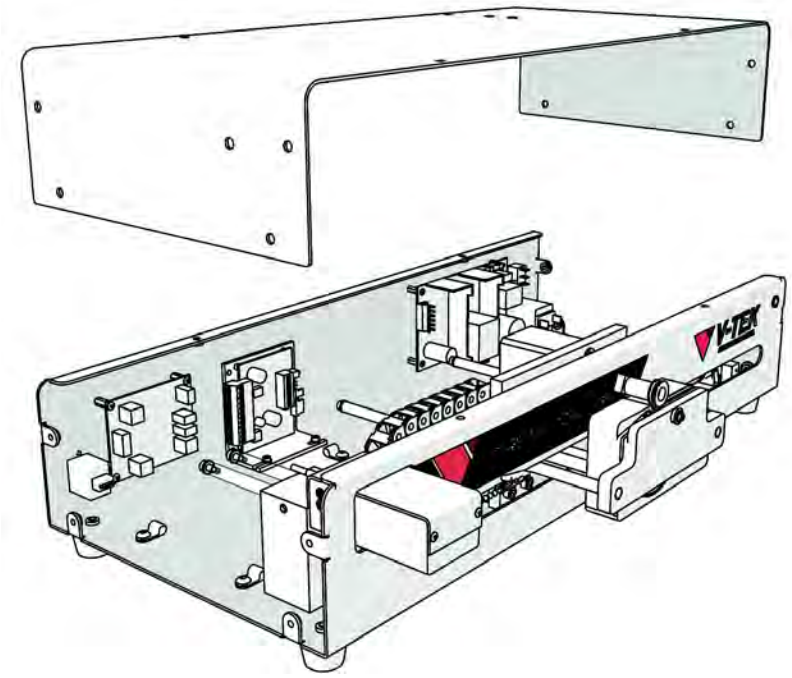


Figure 2.3

4. Set the security bracket on top of the PT-55. Put the two 5/16-18 BHCS through the holes of the PT-55 and security bracket..

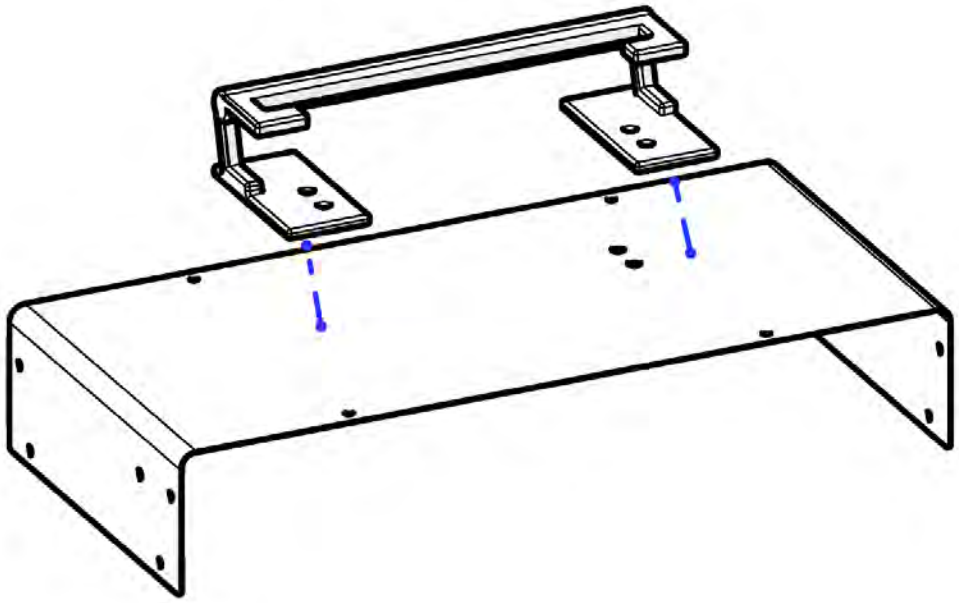


Figure 2.4

5. Tighten the two 5/16-18 nuts on the bolts.

6. Reassemble the top of the PT-55.

Software Setup

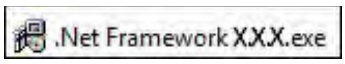
As with any computer system, V-TEK, Inc. recommends users create a computer **Recovery Disk** prior to operation and conduct periodic back-ups as needed. Visit the computer manufacturer's website for instructions on creating a recovery disk.

V-TEK, Inc. does not create or maintain recovery information for this laptop. Creating a recovery disk is solely the users' responsibility.

PT-55 Interface Software Instructions

1. Insert flash drive into PC that will host the interface software.

2. Double click on the **Net Framework** application to open. A security warning will appear, click **Run** to install.



3. Once Net Framework is installed, return to the flash drive and double click **S291257 vx.x.x.zip** to extract the PT-55 software.

4. Double click **S291257 vx.x.x.exe** to open the *PT-55 InstallShield Wizard*.

5. An *Application Install* screen will appear. Click on **Next**.

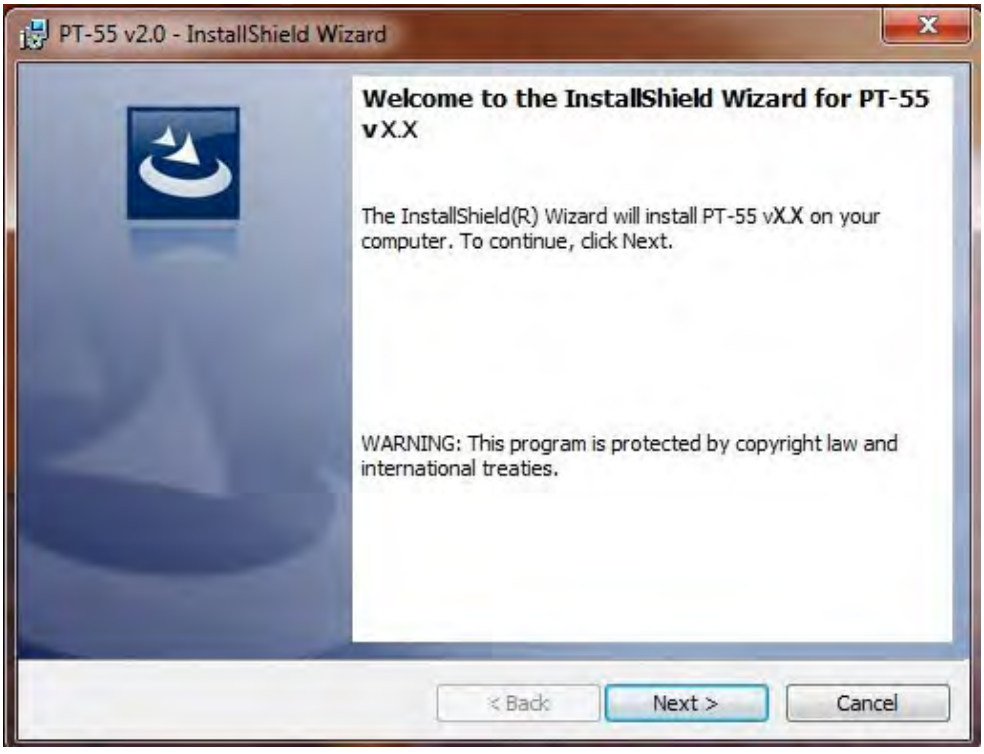


Figure 2.5

6. The *Ready to Install Program* screen will open. Click **Install**.

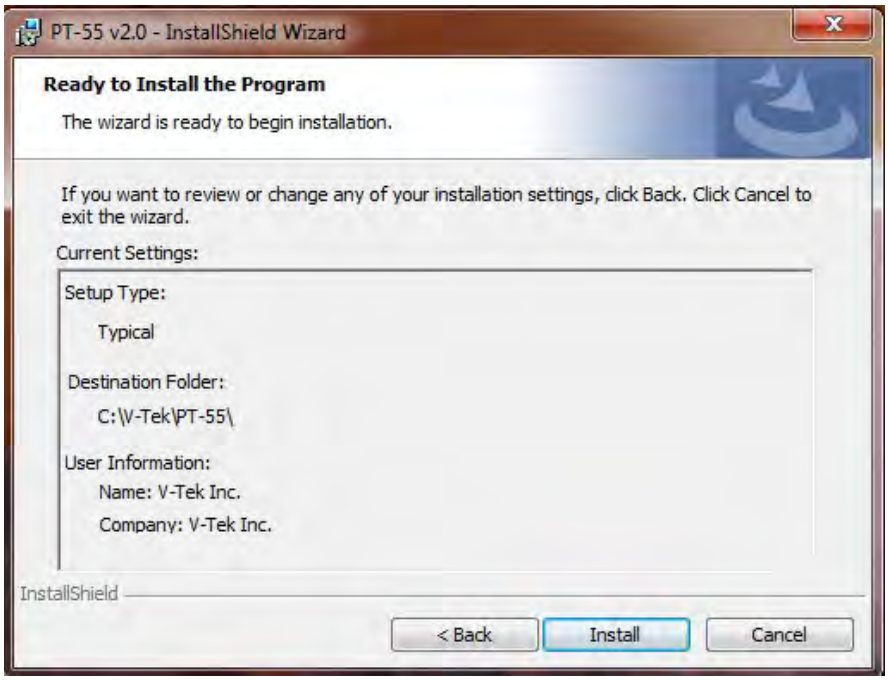


Figure 2.6

7. The *Install Shield Wizard Completed* screen will open. Click **Finish** to complete installation..

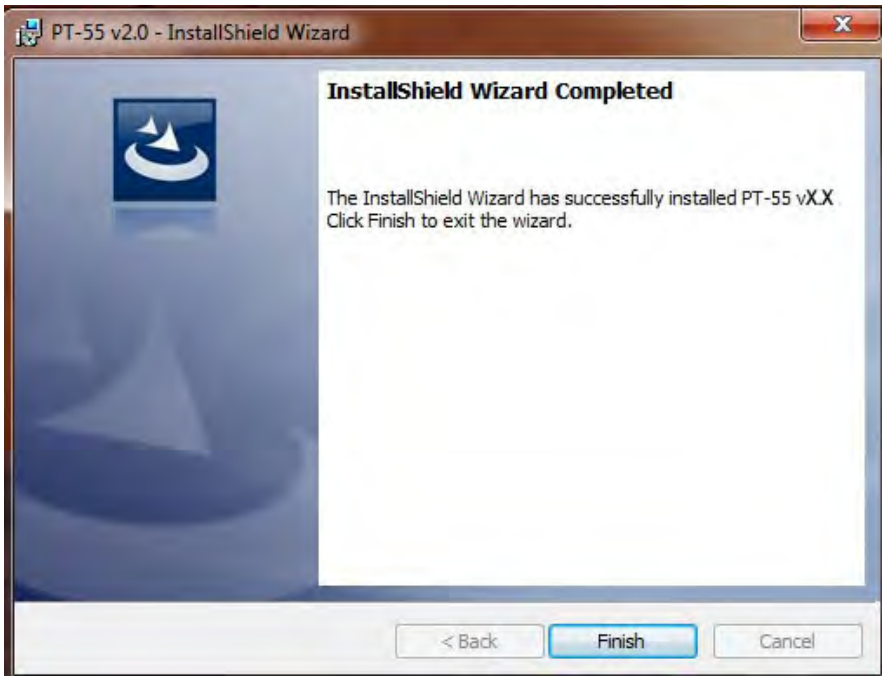


Figure 2.7

8. The **PT-55 Icon** will now appear on the desktop.

PT-55 Driver Installation

After the PT-55 software has been installed, the PT-55 USB/Serial Driver must be installed in the laptop that will run the PT-55.

1. Turn the PT-55 **ON**, then connect the computer to the PT-55 with the USB Cable.

2. Open the **Start Menu** on the target system by clicking the icon on the right.

Right click *Computer* and select *Properties*.

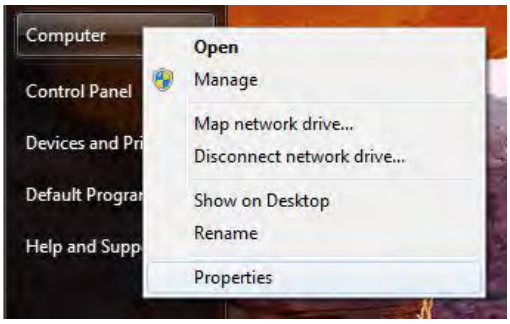


Figure 2.8

3. The *System Control Panel* window will open. Look in the *System Information* section to determine whether or not the target system is 32-bit or 64-bit.

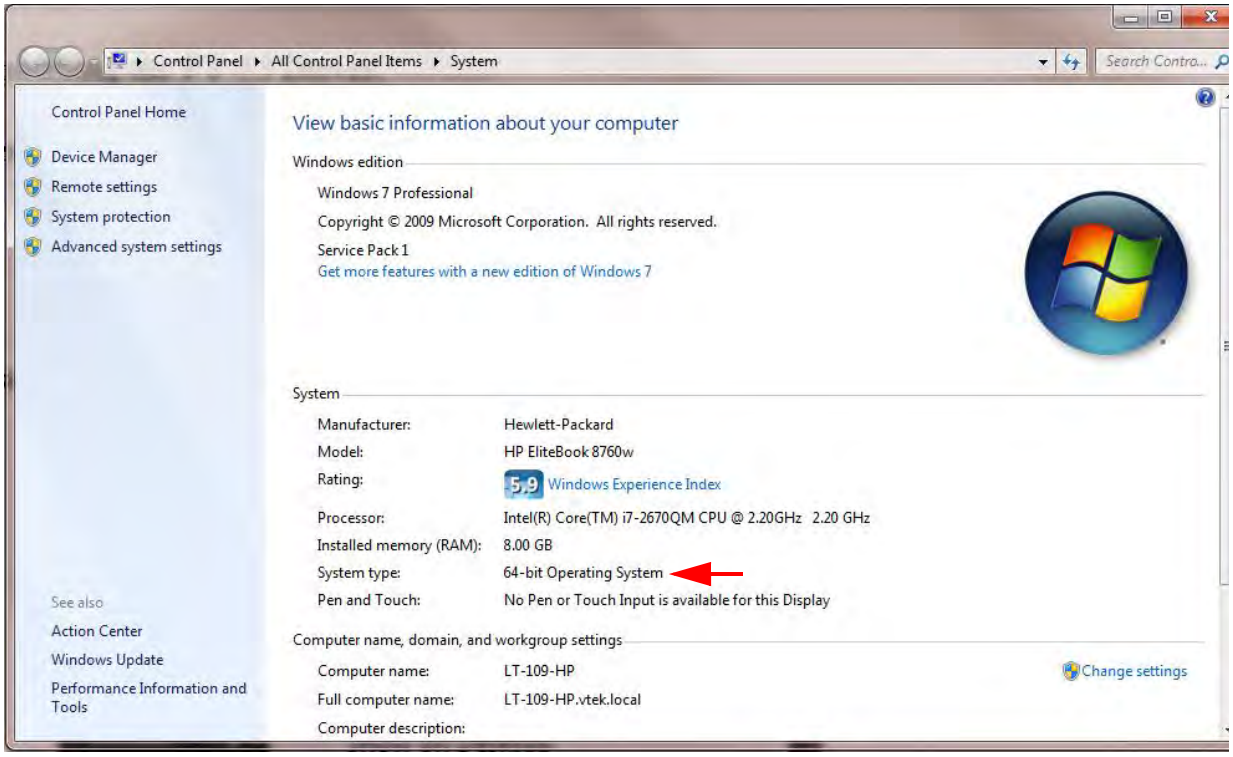


Figure 2.9

4. Navigate to **c:\V-Tek\PT-55\Drivers** and unzip the driver files.

   • Select **x64** for 64-Bit OS

   • Select **x86** for 32-Bit OS

5. Within the *System Control Panel* click **Device Manager**..

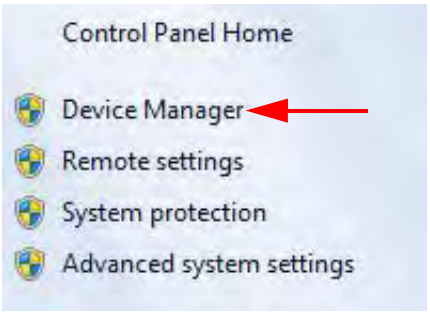


Figure 2.10

6. As shown below, find the unknown device in the *Device Manager*. Right click the device and select **Update Driver Software**..

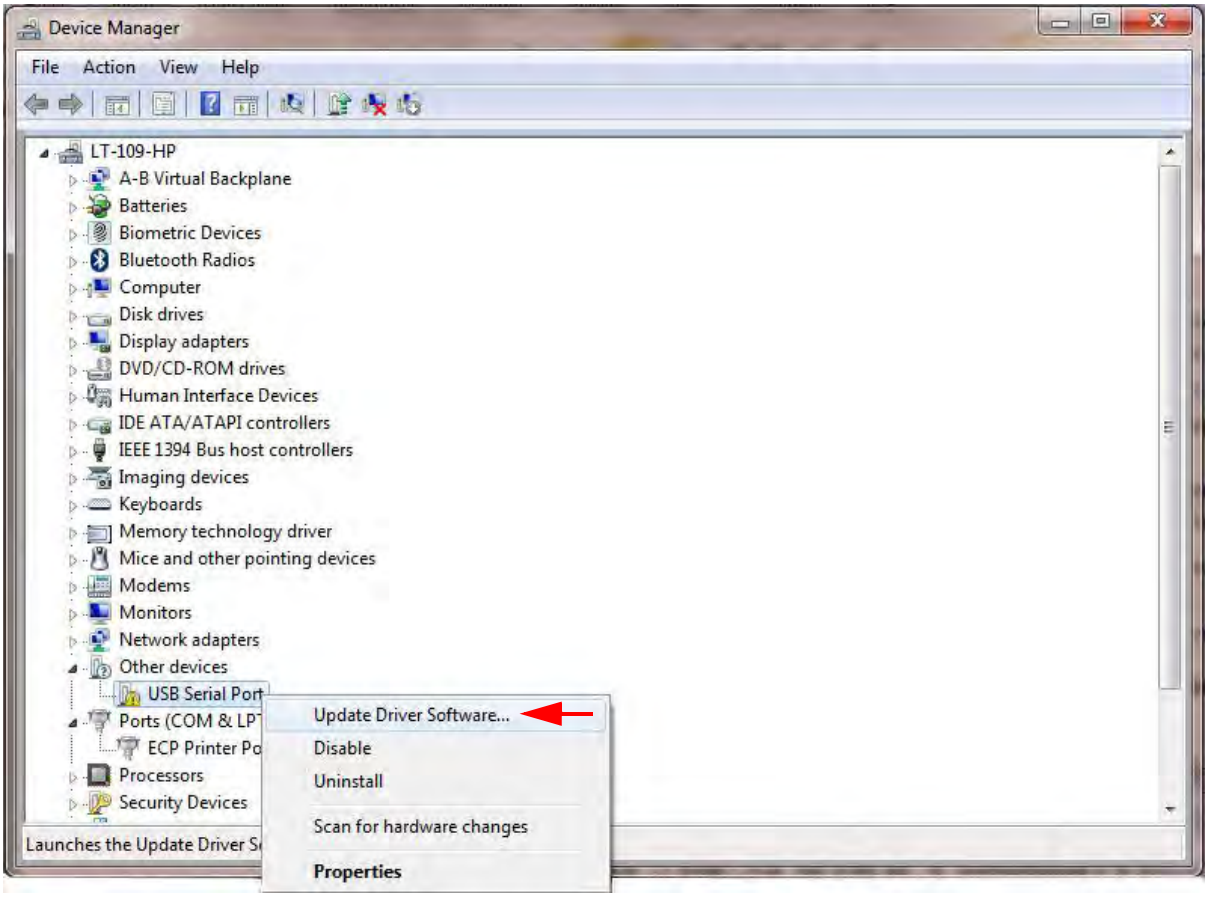


Figure 2.11

7. In the new window select *Browse My Computer for Driver Software* and browse to **c:\V-Tek\PT-55\Drivers\ x64**.

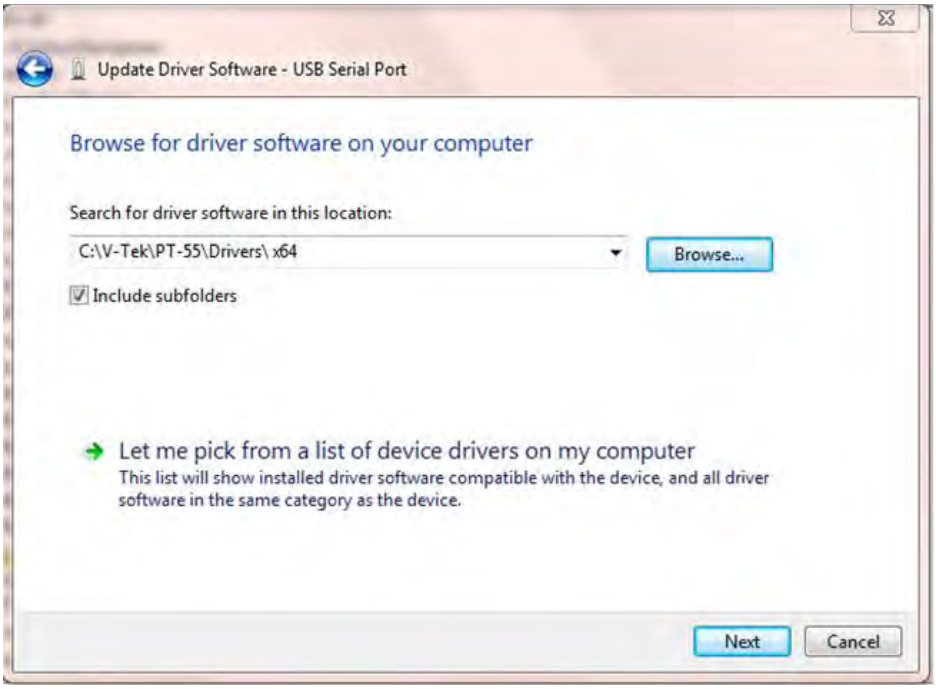


Figure 2.12

Note: x64 is based on a 64-bit OS as previously described. For 32-bit systems this location needs to be **x86**.

8. Click **Next** and wait for the driver to successfully install.

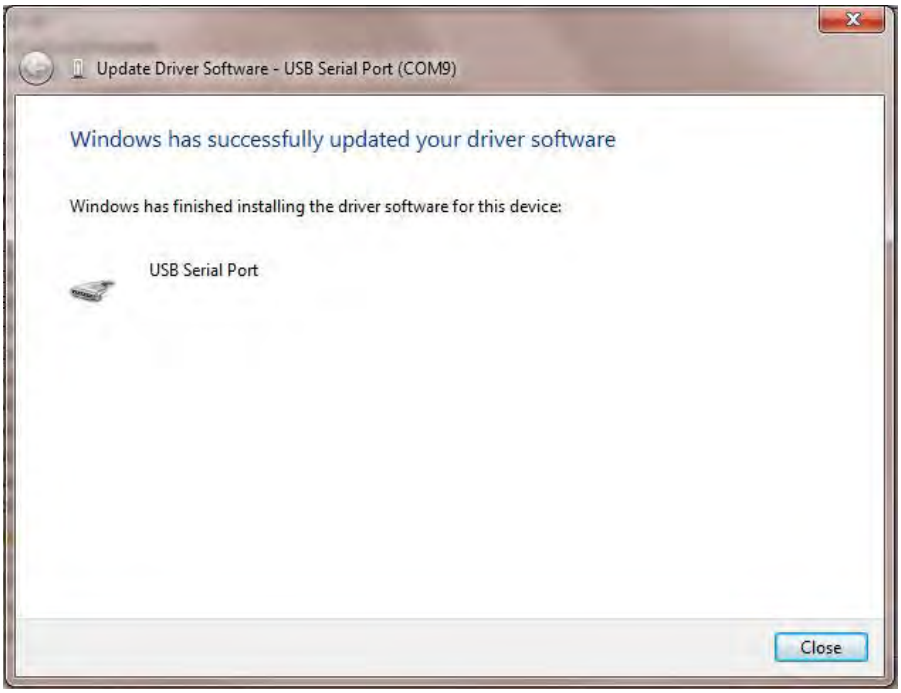


Figure 2.13

Auto Tension Setup

The auto tension feature eliminates having to jog the tape to apply pressure when starting a peel force test. When auto tension is selected and a value is entered, the peel force graph will wait until the auto tension value is reached. After this, it will reset the graph and will start plotting the peel force test.

Setting the Auto Tension

1. From the *Main* screen, click the **Supervisor** button.

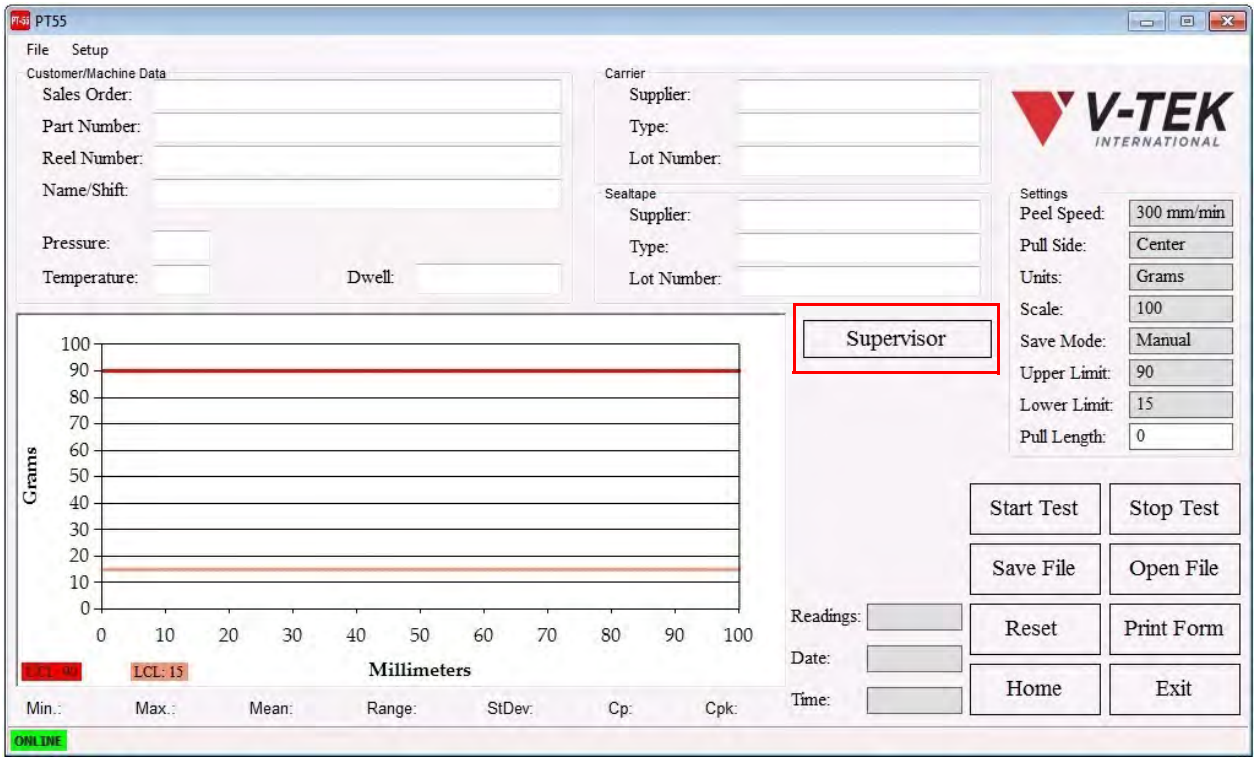


Figure 2.14

2. The *Password Input* screen will appear. Enter the password at the prompt then click **OK**.

Note: The default password is: **password**.

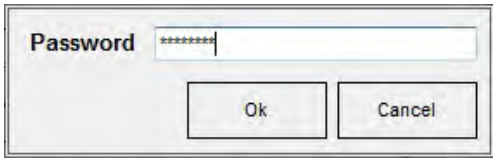


Figure 2.15

3. The *Supervisor Settings* screen will open.

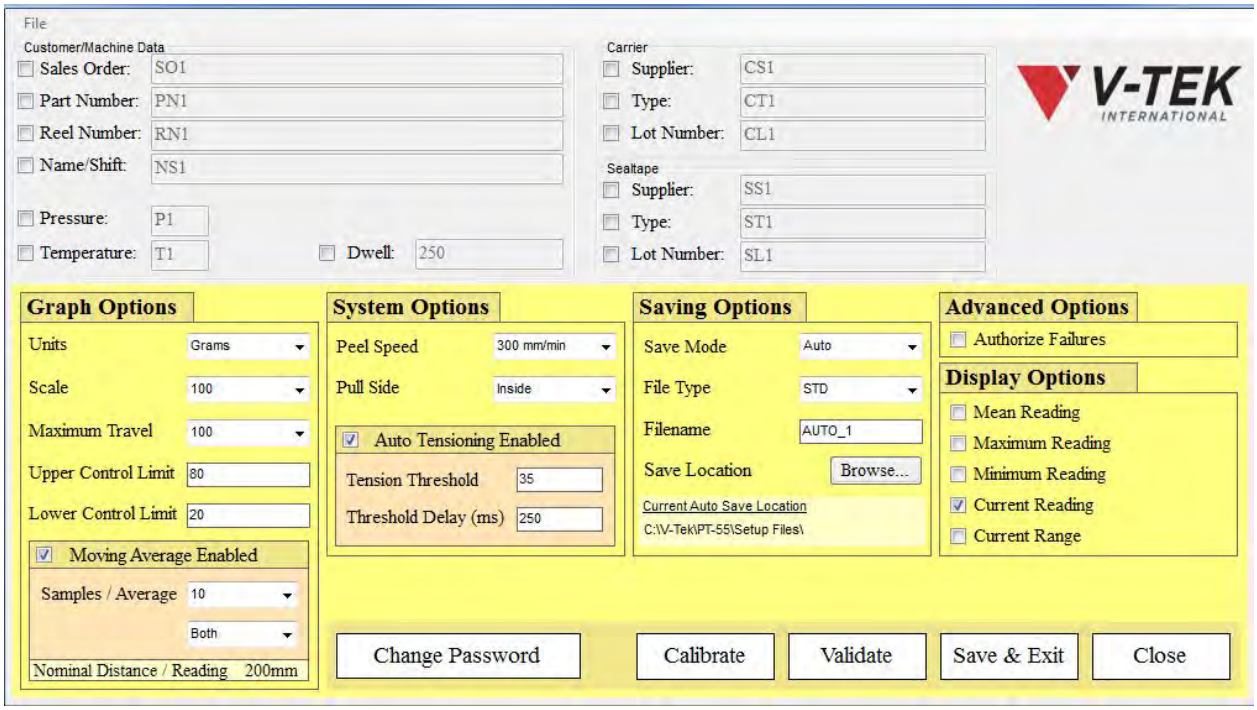


Figure 2.16

4. In the System Options section, ensure **Auto Tension** is **Enabled**. Enter the **Tension Threshold** value and the **Tension Delay** value in milliseconds. The delay is the time from which the carriage assembly starts moving and when the graph starts plotting.

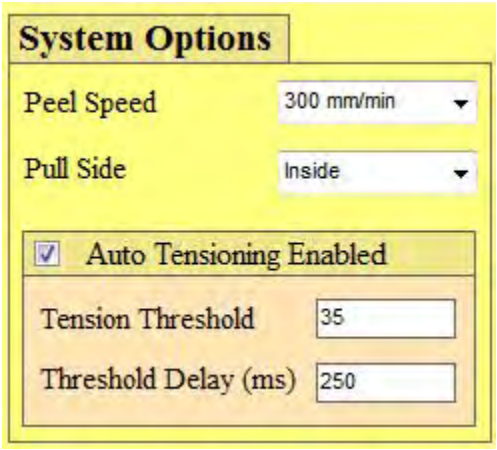
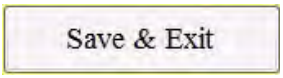


Figure 2.17

5. Click the **Save & Exit** button to return to the *Main Screen*.



6. The **Tensioning** message will flash over the graph until the **Auto Tension Value** is exceeded.

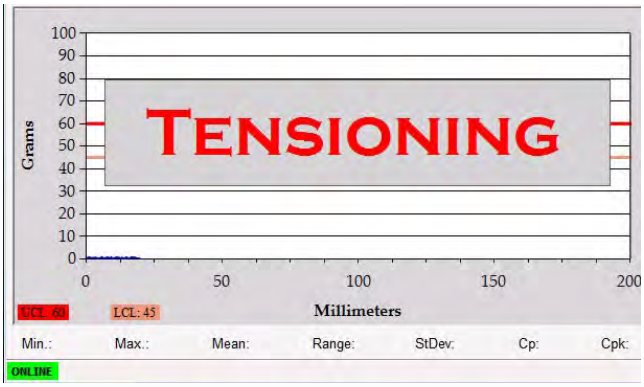


Figure 2.18

7. The PT-55 will then automatically reset the graph and begin plotting the peel force test.

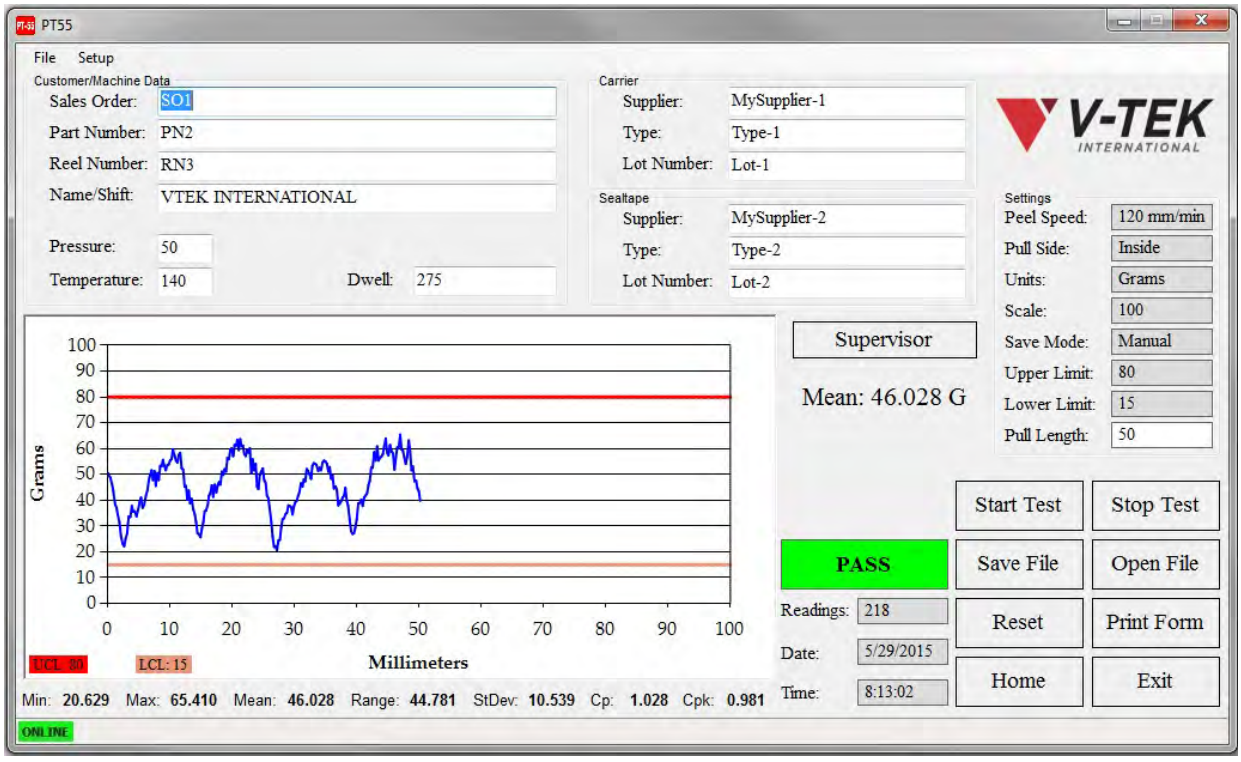


Figure 2.19

Save Mode Setup

The auto save feature allows the user to select between three types of saving options when saving peel test settings as *Master Forms*; **Manual**, **Auto** and **Auto Sales Order.**

In **Manual** save mode, the operator must manually press the **Save File** button each time a save is desired. In **Auto Save** mode, a peel force test is automatically saved to a specific file name and location once the test is completed. In **Auto Sales Order** mode, the file is saved to a specific location under the sales order number.

Setting the Save Mode

1. Select the **Supervisor** button from the *Main Screen* .

2. Enter the password at the prompt and click **OK**.

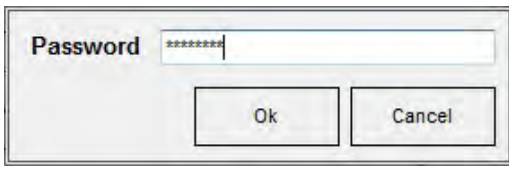
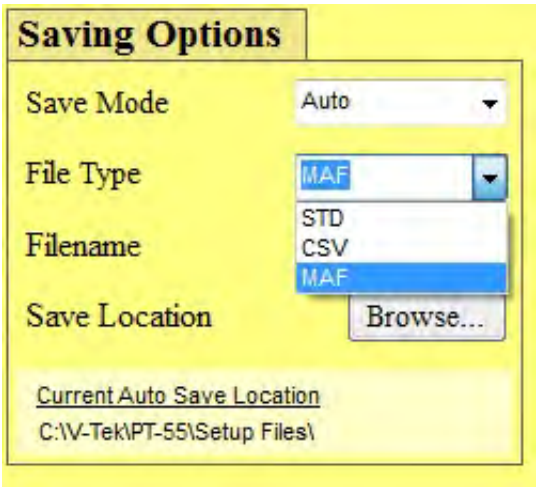


Figure 2.20

3. Select the **Save Mode** drop down menu in the *Saving Options* section.

4. Choose the **File Type** to be used.

5. If *Auto* or *Auto Sales Order* is selected, enter the *Auto Save Filename*.



6. Select **Browse** and choose the desired directory in which to save the file.

Note: The default save location is C:\V-TEK\PT-55\Setup Files.

Peel Force Test Setup

Note: Although the PT-55 is tested and calibrated during manufacture, the calibration should be re-validated after shipment and prior to first use. Please refer to the validation instructions on page 60.

1. To perform a peel force test, run out a strip of empty, sealed carrier about 6 to 12 inches long. Make sure the entire length of the strip has been sealed under the same conditions. Cut the strip free from the taping machine and bring it to the peel force tester.

Figure 2.21

2. Orient the tape to be tested so it is right-side up and the sprocket holes are facing toward the peel force tester. At the right end of the tape, carefully peel back about 1 inch of cover tape.

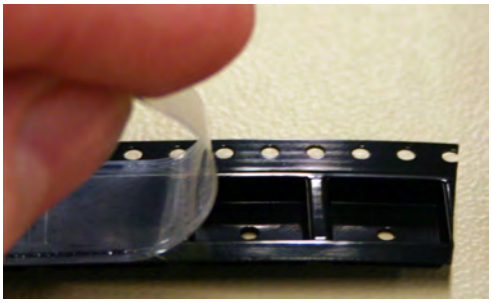


Figure 2.22

3. Attach the alligator clip from the load cell chain to the loose cover tape. Make sure the clip is straight and centered on the tape.

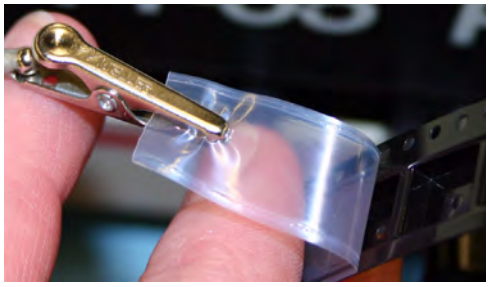


Figure 2.23

4. Adjust the carriage track width, loosening the **Track Adjustment Knob** as needed. The goal is for the track to touch the sides of the tape but still allow it to move freely.

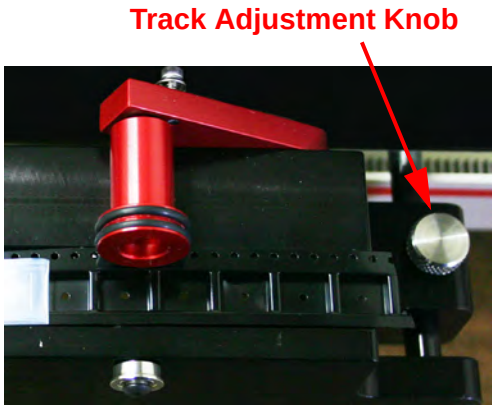


Figure 2.24

5. Lift the idler wheel and attach the carrier tape to the tape sprocket by placing the sprocket holes over the pins. Lower the idler wheels so the tape is captured on the tape sprocket.

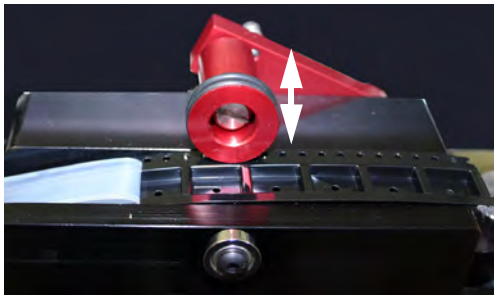


Figure 2.25

6. Pull the load cell assembly out to a position where the chain is centered on the carrier tape. Adjust the thumb screw on the left side of the machine as needed.

   Note: The PT-55 software must be configured with the correct test parameters before continuing. For test configuration details, see *Chapter 3: Software*.

Figure 2.26

7. Press the **Start Test** button in the *Main Screen*. The PT-55 will begin moving the carriage and graphing the results.

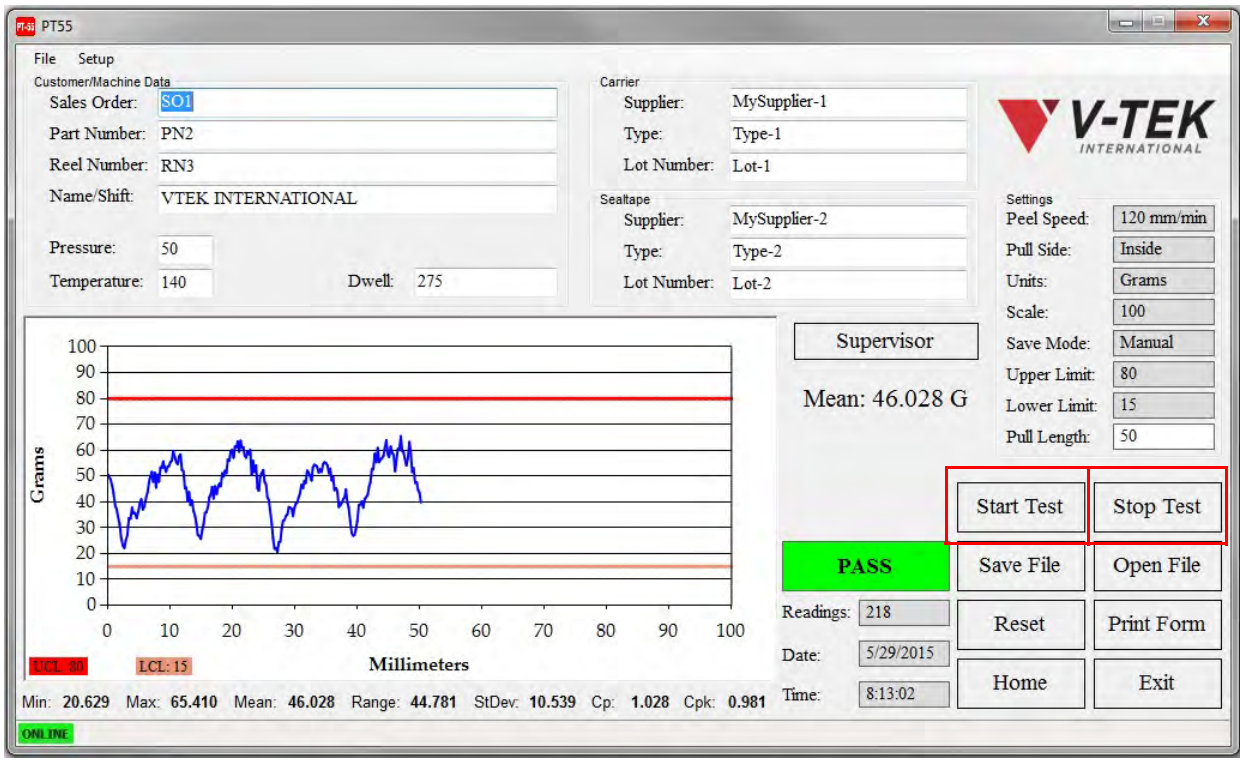


Figure 2.27

8. When complete, the test will stop automatically when it reaches the preset **Pull Length**. You may also press the **Stop Test** button when enough data has been gathered to complete the test. The *Main Screen* will then display a **PASS** or **FAIL** message. The photo above shows a completed test that passed the Pull Test criteria.

9. Release the cover tape from the alligator clip and remove the carrier tape from the tape sprocket by lifting the idler wheel and lifting the tape clear of the sprocket pins.

Chapter 3: Operation

Contents

PT-55 Software

PT-55 SMD Tape Peel Force Tester Software
by V-TEK, INC.

Found on included flash drive.

Introduction

This document provides the basic instructions for operating the PT-55 Peel Force Tester software package. This program will operate the carrier tape drive assembly and generate a graphic display of the peel force required to remove the cover tape.

It is possible to record the peel test results in a Comma Separated Value (*.csv) or a Moving Average File (*.maf) format which can be converted to a spreadsheet. The peel test graphic display can also be printed for records.

Main Screen Details

Start the application by double clicking the **PT-55 Software** icon.

The *Main Screen* (pictured below) will appear. This screen is used to configure peel tests, set test parameters, perform tests and observe test results. All of the fields will be blank.

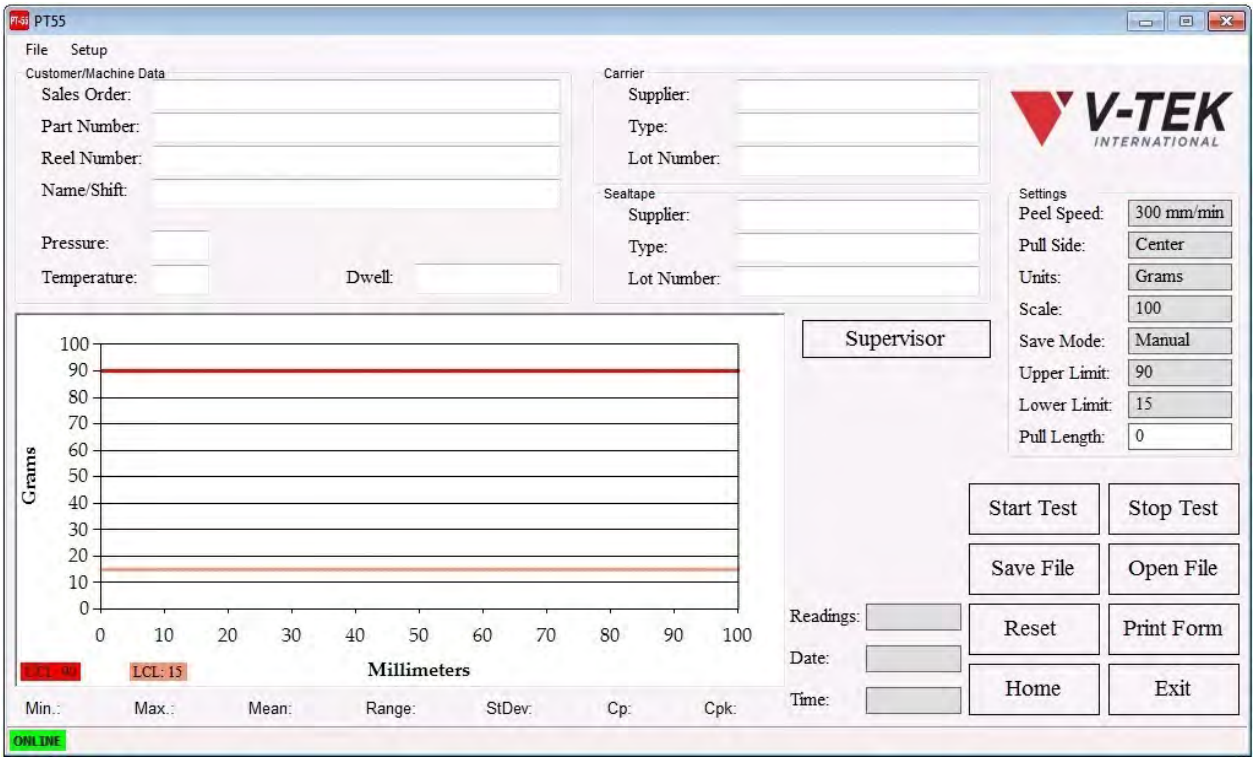


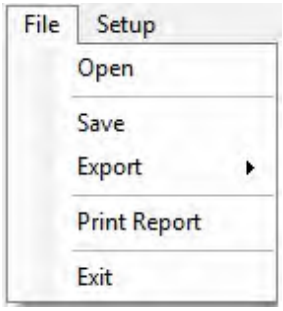
Figure 3.1

Menus

The File Menu is located in the top left corner of the *Main Screen*.

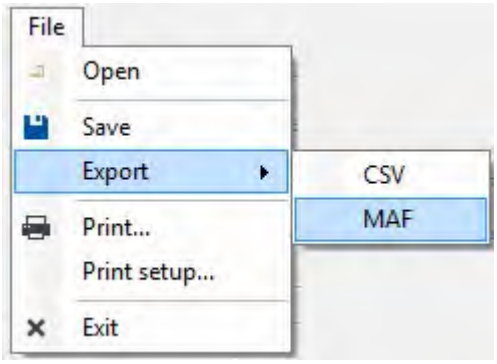
File Menu

Selecting **Open** will allow the operator to select and open a previously saved *Master Form*.

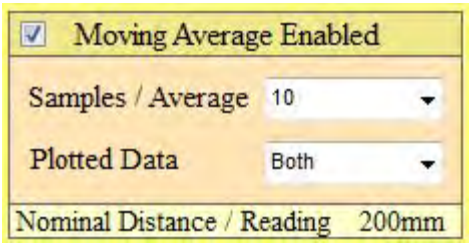


The **Save** command creates or updates a *Master Form* with the current test settings and data.

Export exports a Comma Separated Value File (.csv) or a Moving Average File (.maf) text file of report data.



Note: the MAF option will only appear if **Moving Average** is enabled in the *Supervisor Screen*.



Print prints an exact copy of the screen (including the test and customer data). The printout can then be kept for records.

Print setup allows the user to select a printer and configure print settings.

The **Exit** command will close the PT-55 Software program. Any unsaved data will be lost.

Customer/Machine Data Fields.

Figure 3.2

The *Customer/Machine Data* section is used to collect information specific to a particular order. Its fields can be customized in the *Supervisor Settings* window. The default fields include **Sales Order, Part Number, Reel Number, Name/Shift,** and the **Temperature, Pressure,** and **Dwell** fields which are used to create the seal being tested

Carrier Fields.

Figure 3.3

The Carrier section tracks carrier tape information. Its fields include **Supplier, Type,** and **Lot Number**

Sealtape Fields

The *Sealtape* section is used to track information about the seal tape (also known as cover tape) that is used in a test. Sealtape fields include **Supplier, Type,** and **Lot Number**.

Figure 3.4

Settings

The *Settings* section is used to configure the Peel Force Test..

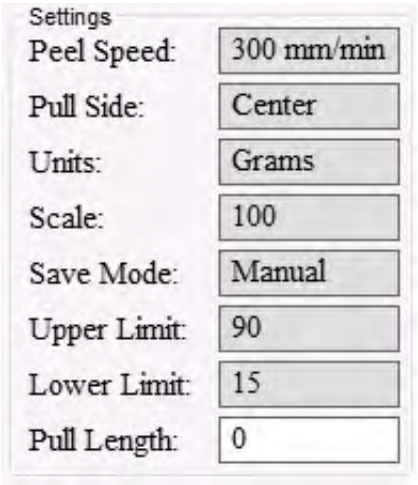


Figure 3.5

> **Note**: With the exception of *Pull Length*, the *Settings* fields may only be changed by using a supervisor password.

Pull Length

Setting the pull length allows the user to stop the peel force at a desired length. For example, if the *Pull Length* is set at 150, the peel force test will stop at 150mm. *Pull Length* should be set between 0-200 mm.

> **Note**: If the *Pull Length* is set to 0, the pull test will default to the *X Axis Maximum* which was set in the *Supervisor Settings* screen. If the *X Axis Maximum* setting is different than the *Pull Length* setting, the pull test will stop at whichever length is shortest.

Click the **Supervisor** button to open the *Supervisor Settings* screen. Details on the *Settings* fields can be found in the *Supervisor Settings Screen Details* section which follows.

Peel Test Graph

The *Peel Test Graph* displays the test parameters that were configured in the *Settings* section. The example below shows a Peel Test Graph after settings have been configured and before the test has been run.

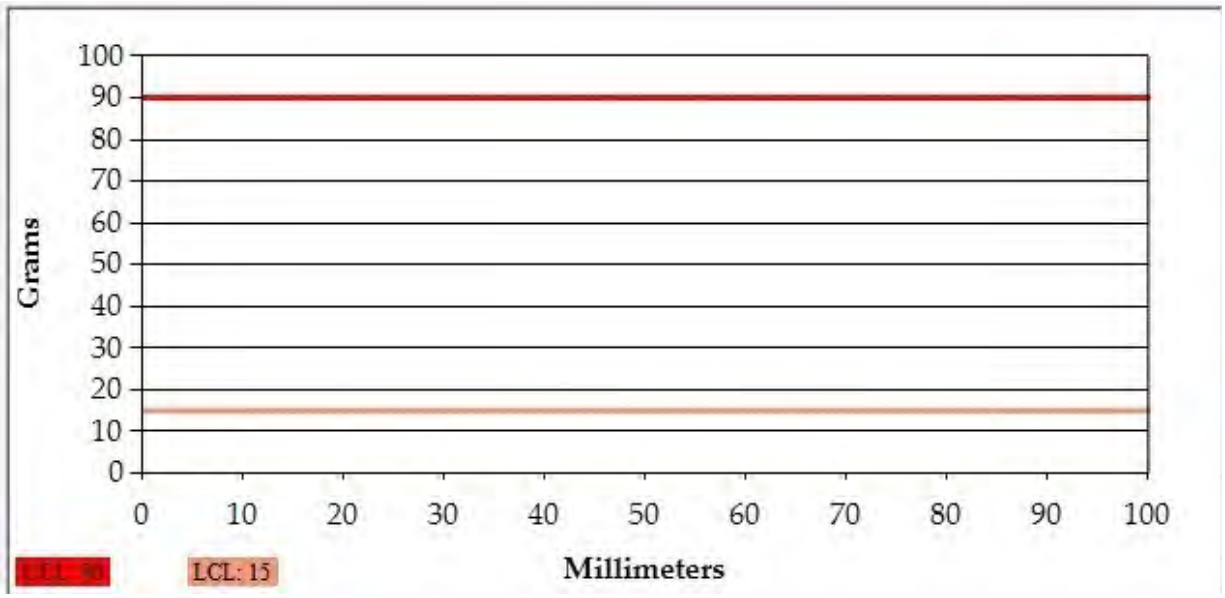


Figure 3.6

The *Upper Limit* value of 90 is represented by a red line while the *Lower Limit* value of 15 is represented by a pink line. The graph's x axis is 100 mm long which corresponds to the *X Axis Maximum* value which was set in the *Settings* section.

> **Note**: The PT-55 will read a *Pull Length* value of 0 as no pull length limit. In this case, the pull length will be the maximum distance of 100mm.

If **Auto Tensioning** is configured in the *Supervisor Settings* screen, the graph will appear as below while auto tensioning is in progress. Once Auto Tensioning is complete, the PT-55 will automatically begin the pull test.

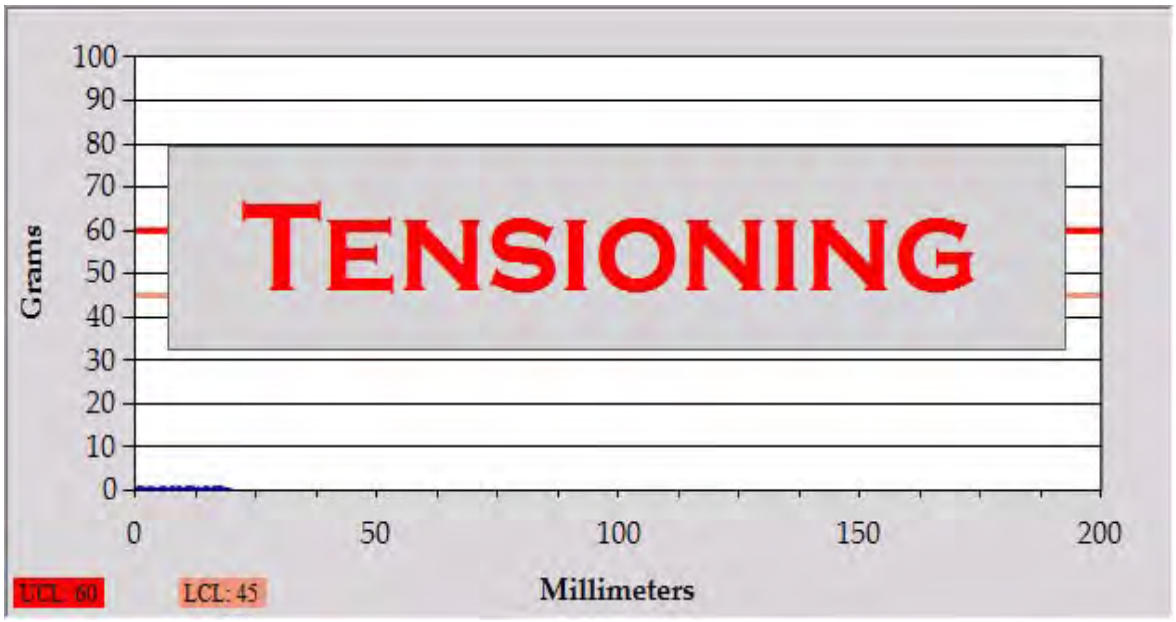


Figure 3.7

During and after a peel test, the *Peel Test Graph* displays the test results. The test below shows a test with **Moving Average Disabled** in the *Supervisor Screen*. All readings are between the *Upper* and *Lower Limit* values, a **PASS** result.

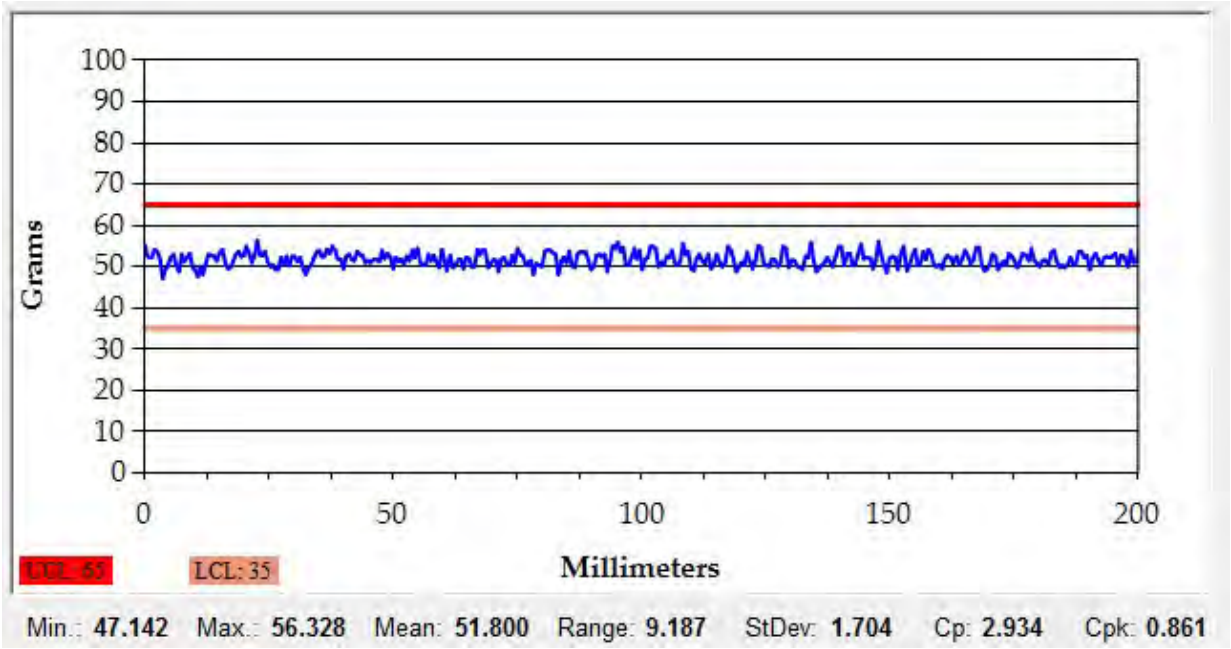


Figure 3.8

The test below shows a test with **Moving Average Enabled** in the *Supervisor Screen*. The **blue** line represents all readings. The **pink** line represents the moving average. All readings are between the *Upper* and *Lower Limit* values, a **PASS** result.

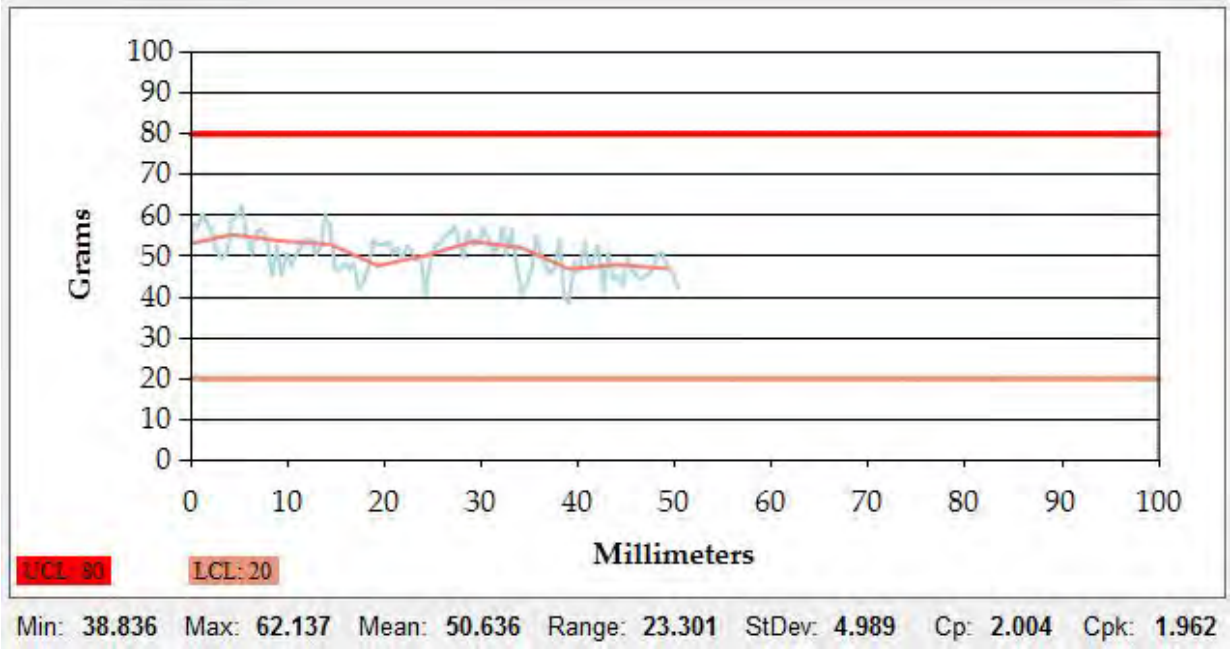


Figure 3.9

The test below shows Moving Average **Enabled** in the *Supervisor Screen*. The **blue** line represents all readings. The **pink** line represents the moving average. While some of the individual readings exceed the *Upper Limit* value, the moving average is between the Upper and Lower Limits, a **PASS** result.

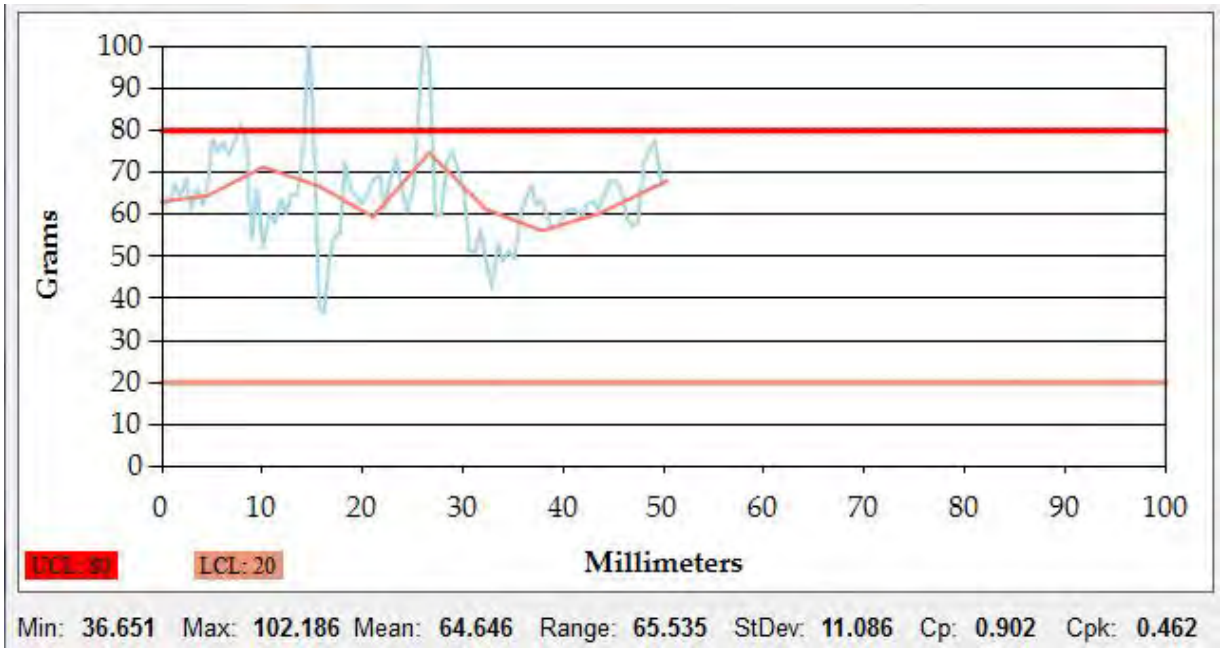


Figure 3.10

The test below shows Moving Average **Enabled** in the *Supervisor Screen*. The **blue** line represents all readings. The **pink** line represents the moving average. Both the readings and the moving average exceed the *Upper Limit* value, a **FAIL** result.

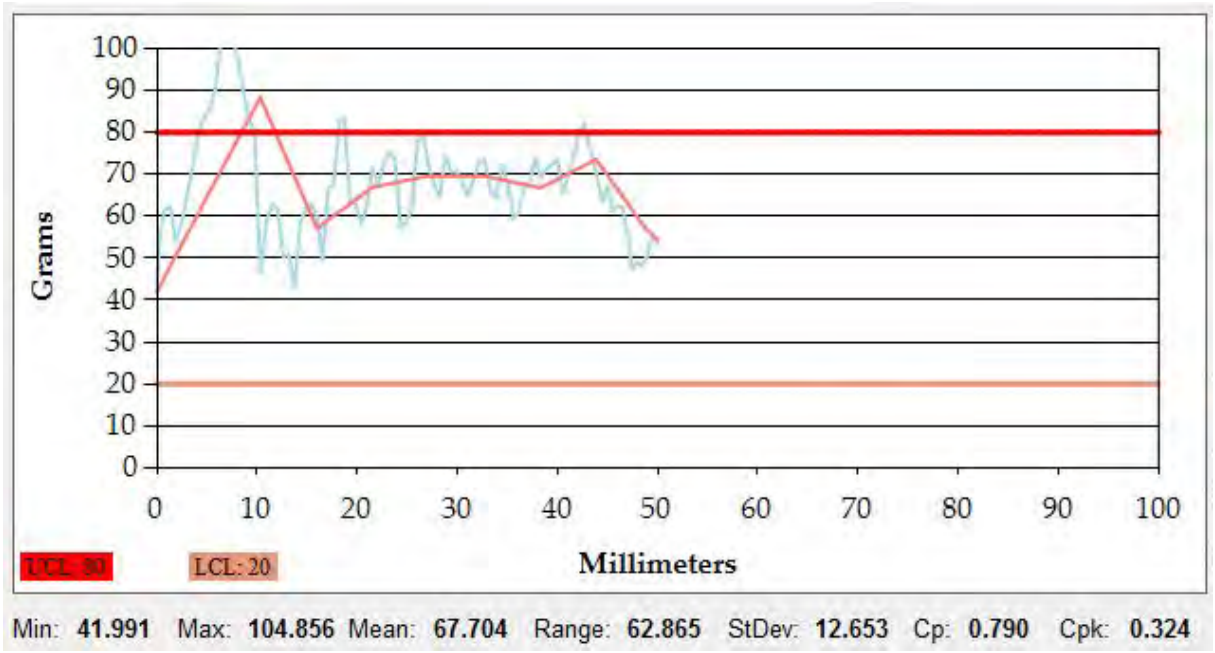
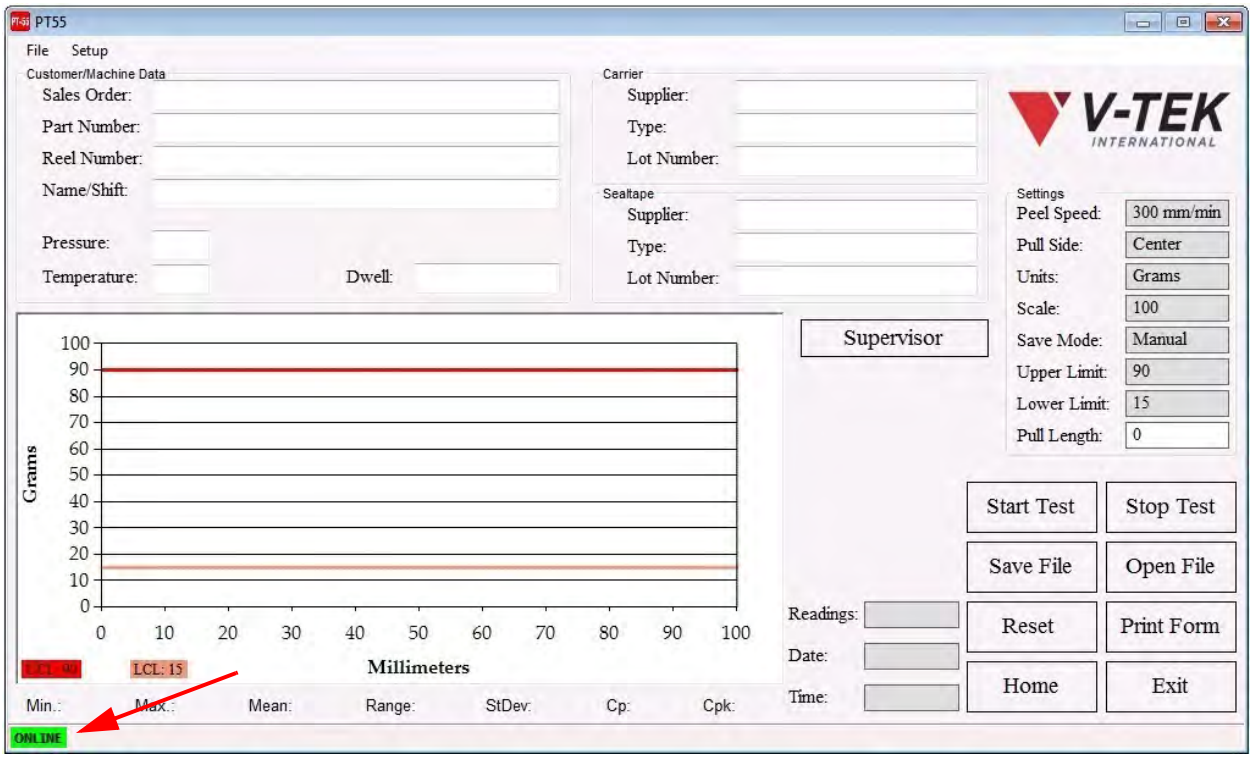


Figure 3.11

Auto & Manual Connect

The connection status between the PT-55 and the computer HMI is displayed in the bottom left corner of the Main Screen. In the picture below, the connection status is **ONLINE**.



The PT-55's **Autoconnect** feature looks for a disconnected state every 15 seconds and automatically reconnects the PC to the PT-55 if it senses the computer is **OFFLINE**. While the HMI is reconnecting, a **Connecting** message will appear in the bottom left corner of the screen.

The HMI can be quickly reconnected manually at any point by double-clicking the **OFFLINE** message to force the PT-55 HMI to attempt to connect to the PC via USB.

Peel Test Statistics

The bar along the bottom of the graph displays a number of values..

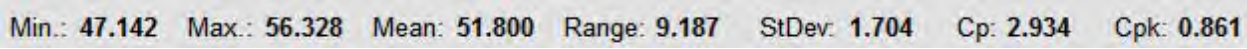


Figure 3.12

Min
Minimum peel force from a peel force test.

Max
Maximum peel force from a peel force test.

Mean
The average peel force from a peel force test.

Range
The minimum peel force test subtracted from the maximum peel force test.

StDev (Sample Standard Deviation)
Measurement of how much the data is scattered. The formula for this calculation is:

Cp (Process Capability)
An indicator of process capability.

The formula for this calculation is: **Cp = (UCL - LCL) / 6s)**

Cpk (Process Capability Index)
Adjustment of Cp for the effect of non-centered distribution.

The formula for this calculation is: **Cpk = Min [($\bar{x}$ - LCL) / (3s) ; (UCL - $\bar{x}$) / (3s)]**

> **Note**: **Cpk** measures how close the peel force is to the target and how consistent the average performance is.

Control Buttons.

There are eight control buttons in the bottom right corner of the *Main Screen.*

Figure 3.13

Start Test

Clicking on Start Test initiates the Seal Test process, setting the carriage motion and graphing results on the *Main Screen*.

Stop Test

Clicking on Stop Test completes the Seal Test process and displays a Pass or Fail message in the Main Screen.

> **Note:** Seal Tests stop automatically when the test reaches its **Pull Length** setting. Clicking **Stop Test** allows the operator to stop the test as soon as enough data is gathered.

Save File

Clicking on **Save** will bring up the screen below. Files are automatically saved in **Recipe (*.rcp)** format..

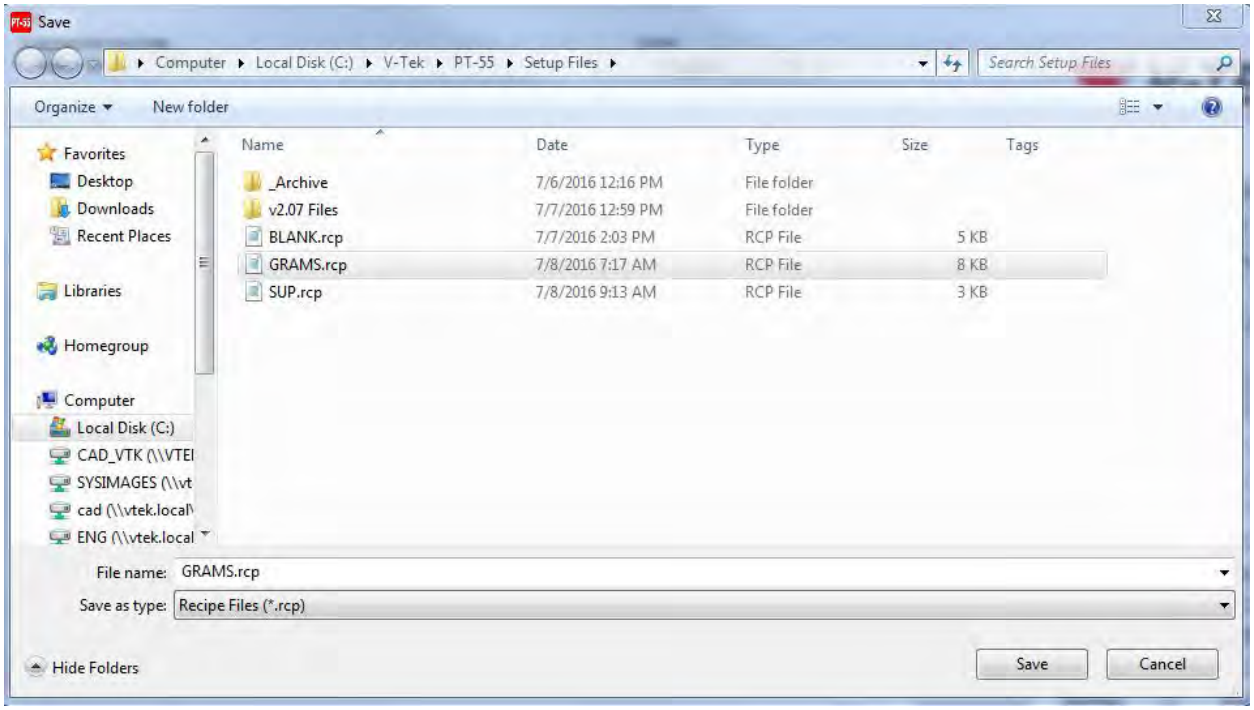


Figure 3.14

Choose a name for the file, select a location, and click on **OK**. The default location is **V-TEK\PT-55\Setup Files**. This folder is automatically created when the software is installed.

Open File

Clicking on **Open File** will allow the operator to select from any previously saved jobs..

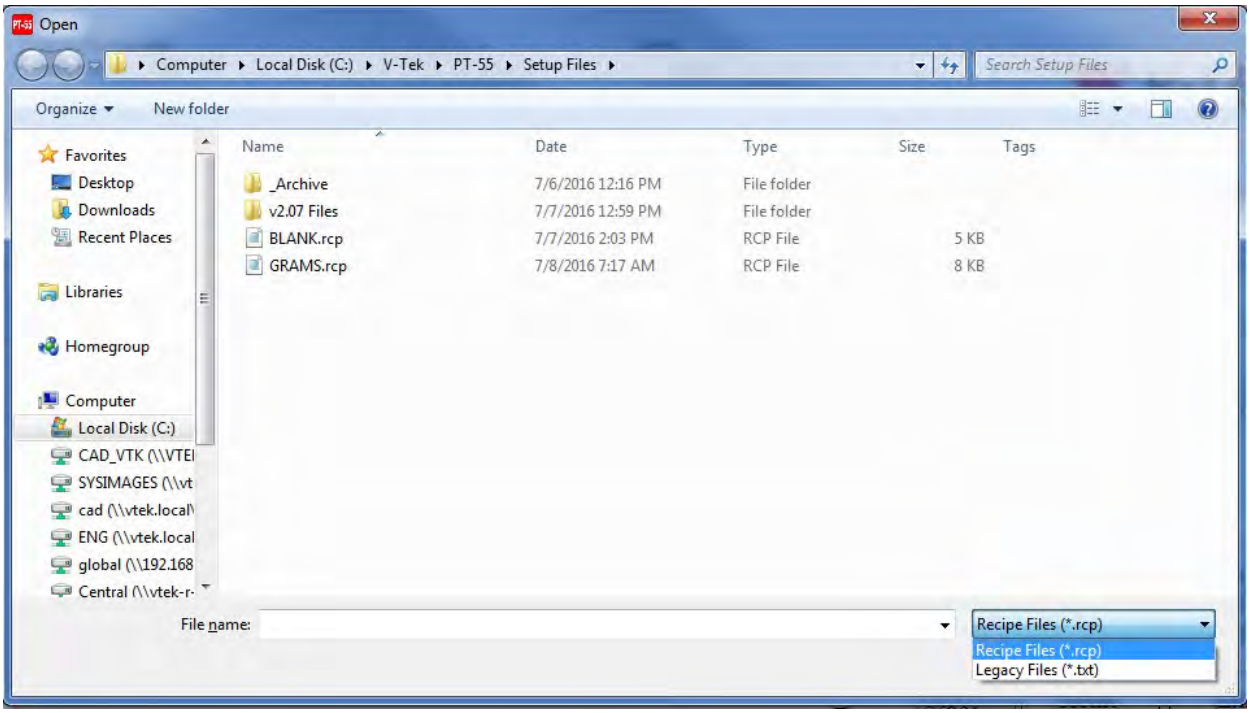
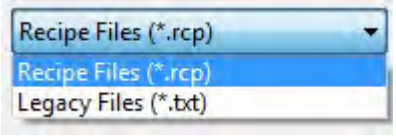


Figure 3.15

Note: Files are automatically saved to a **Recipe (*.rcp)** format. However, if earlier versions of PT-55 software were used to save files, they will appear as **Legacy (*.txt)** files.



Reset

Clicking **Reset** will prepare the software to perform another test using the same parameters as the test just completed.

Print Form

Clicking on **Print Form** will bring up the screen (or one very similar) shown below. It is suggested that landscape orientation be used when printing. Select the printer and then click on **OK**.

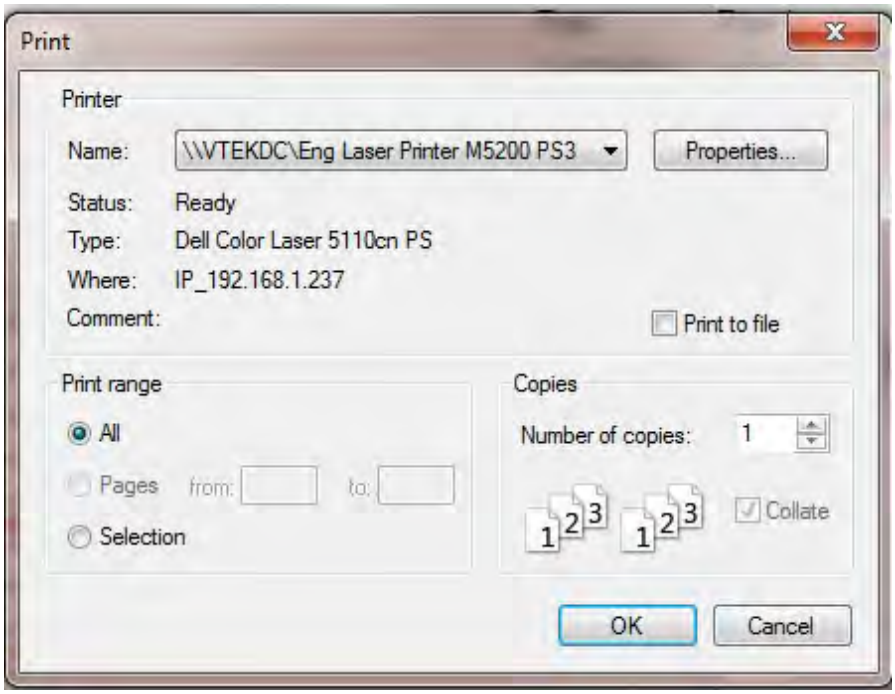


Figure 3.16

An exact copy of the screen (including the test and customer data) will be printed. The printout can then be kept for records.

Home

Press **Home** to reset position of carriage for next peel force.

Exit

The **Exit** button will close the PT-55 software program. This button can be clicked at any time. All data which has not been saved will be erased.

Supervisor Settings Screen

The *Supervisor Settings* screen can only be accessed by entering a supervisor password. Click the **Supervisor** button in the *Main Screen* to access the *Password Input* screen and open *Supervisor Settings*.

The *Password Input* screen will appear. Enter the password at the prompt and click **OK**.

Note: The default password is “password”. Click the **Change Password** button in the *Supervisor Settings* screen to create a new password.

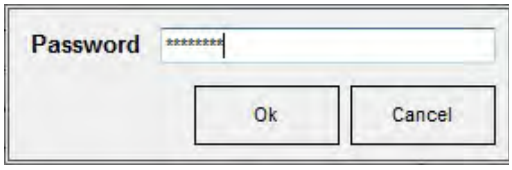


Figure 3.17

After the correct password is entered, the *Supervisor Settings* screen will appear.

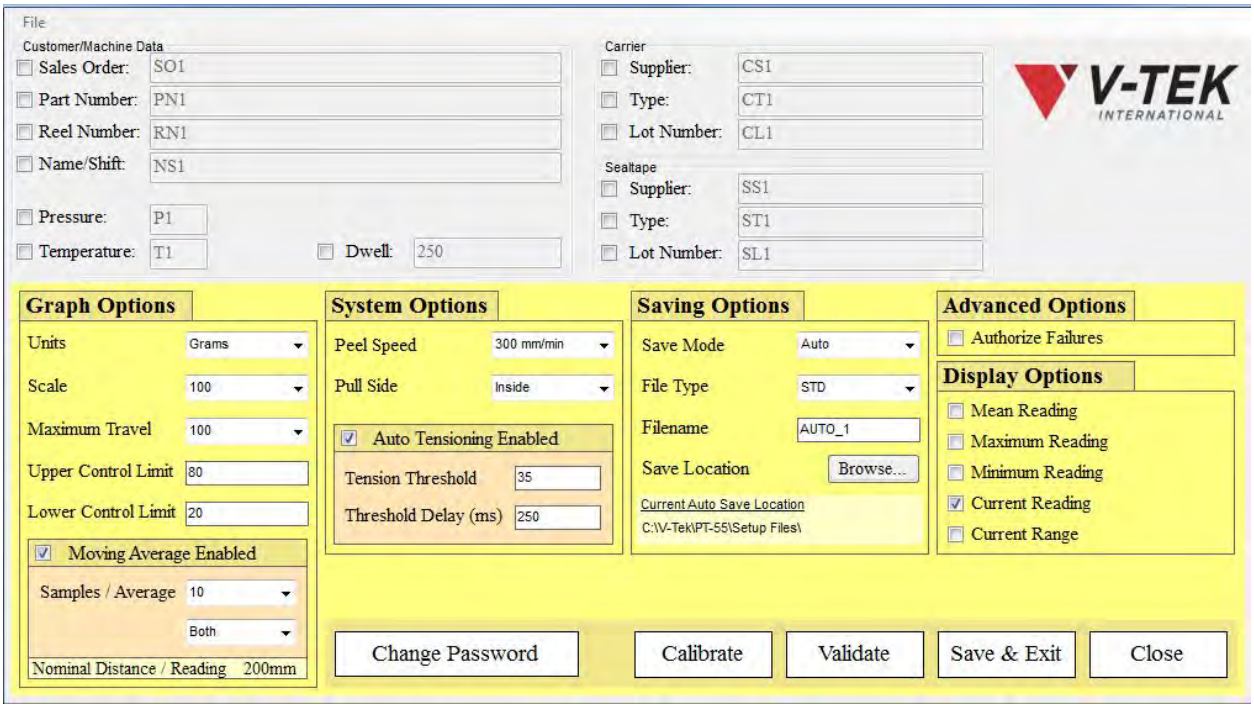


Figure 3.18

The *Supervisor Settings* screen determines what fields, test options and graph options appear in the *Main Screen* and in printed reports. Notice that each of the *Main Screen* fields now have a check box next to them. Field content and format can be edited by clicking the check box of the field you wish to edit.

Customize Main Screen Fields

Click in the check box next to the field you'd like to edit to open the *Change Data* window.

Figure 3.19

The *Change Data* window allows the user to customize each field's *Label*, *Visibility* and *Input Type*.

Editing Field Labels

In the example below the *Sales Order* field has been selected for editing.

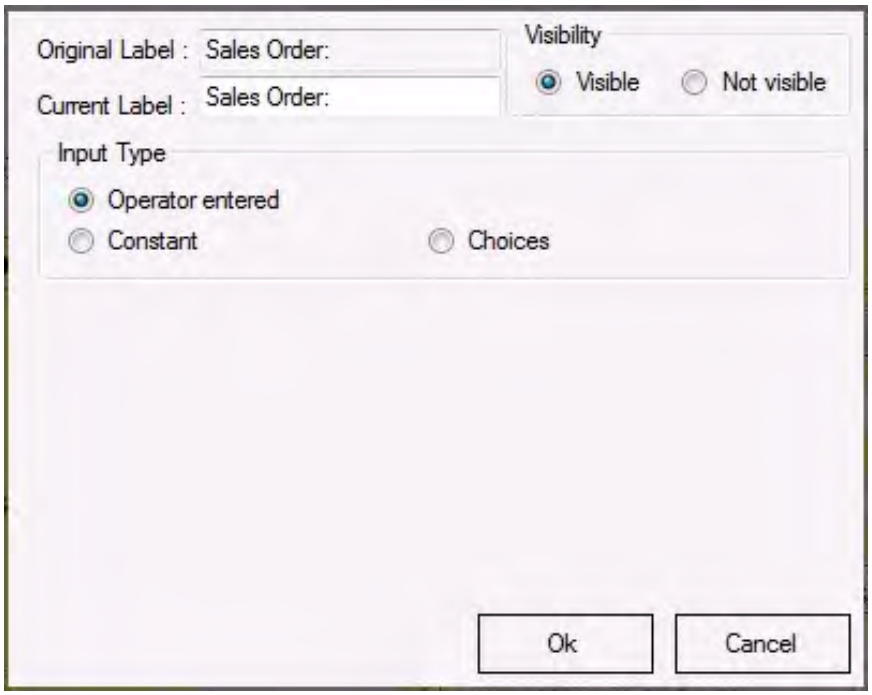
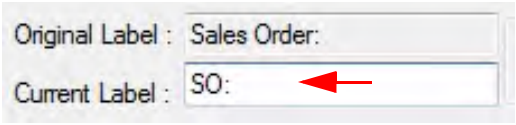


Figure 3.20

Enter new text in the *Current Label* field to customize the field label. In this example, the *Sales Order* Field has been changed to "**SO:**"



In the *Main Screen*, the field will now appear as follows:

Figure 3.21

Editing Field Visibility

The *Supervisor Settings* screen can also be used to change the visibility of a field. This is useful for streamlining test data entry for operators as unused fields can be hidden.

Click in the check box of the field to be edited to open the *Change Data* window. Again, the *Sales Order* field has been selected for this example and the **Not Visible** option is chosen..

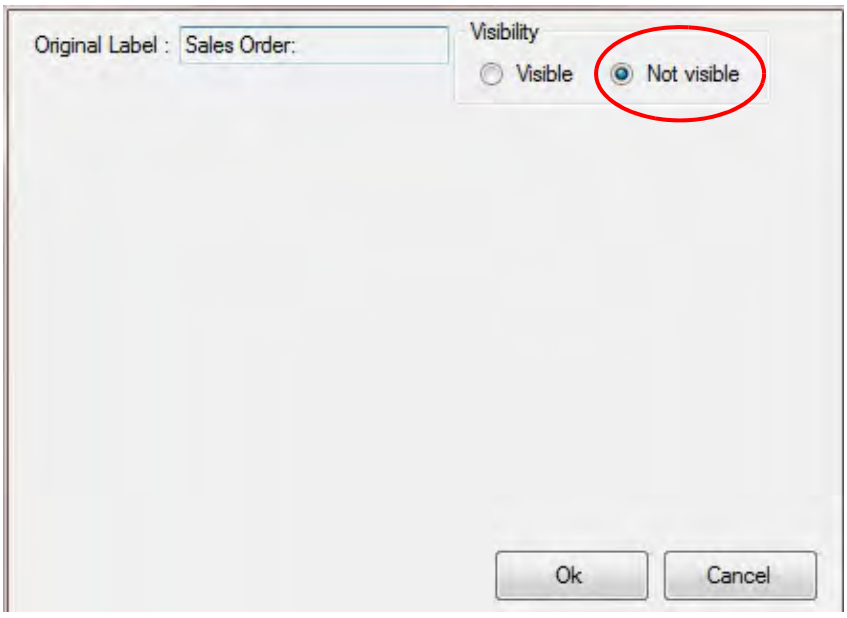


Figure 3.22

Note: When **Not Visible** is chosen, all other *Change Data* fields disappear. Selecting **Visible** will once again reveal the *Label* and *Input Type* fields in the *Change Data* screen.

When **Not Visible** is selected, the field no longer appears in the *Main Screen*.

Figure 3.23

In the example above, the *Sales Order* field which used to appear above the *Part Number* field is no longer visible.

Editing Field Input Choices

There are three types of Input Choices available for most of the fields in the *Main Screen*. Select the check box next to the field you wish to edit to open the *Change Data* screen. The *Sales Order* field has been selected in the example below.

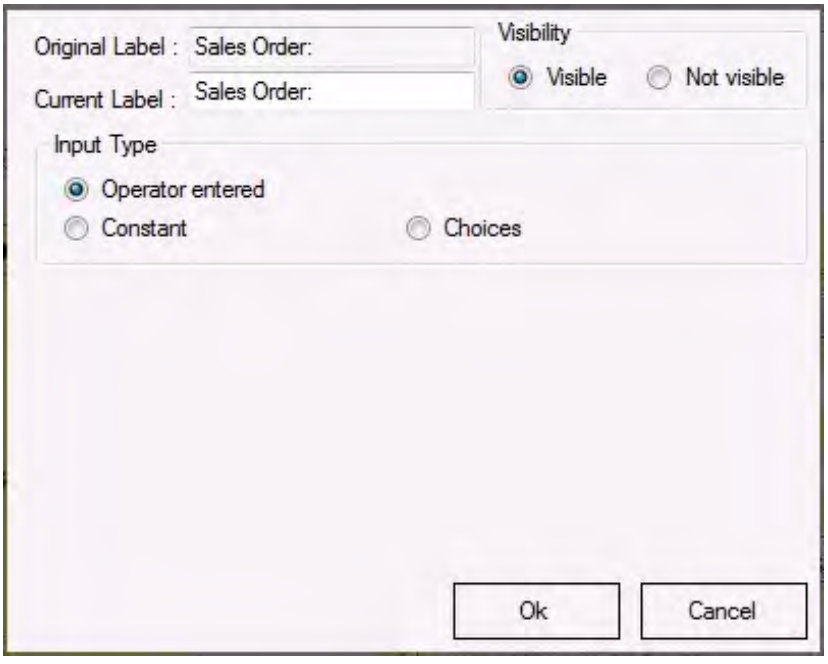


Figure 3.24

Operator Input Type

When Operator entered is selected, a text box appears next to the field in the *Main Screen*. This allows the operator to type in the desired information.

When the *Pressure* or *Temperature* fields are selected, an **Operator entered double** option appears under *Input Type*. This creates two text entry fields to allow the operator to track *Inside* and *Outside Seal* data for those two categories of information. The *Pressure* field label is selected in the example below.

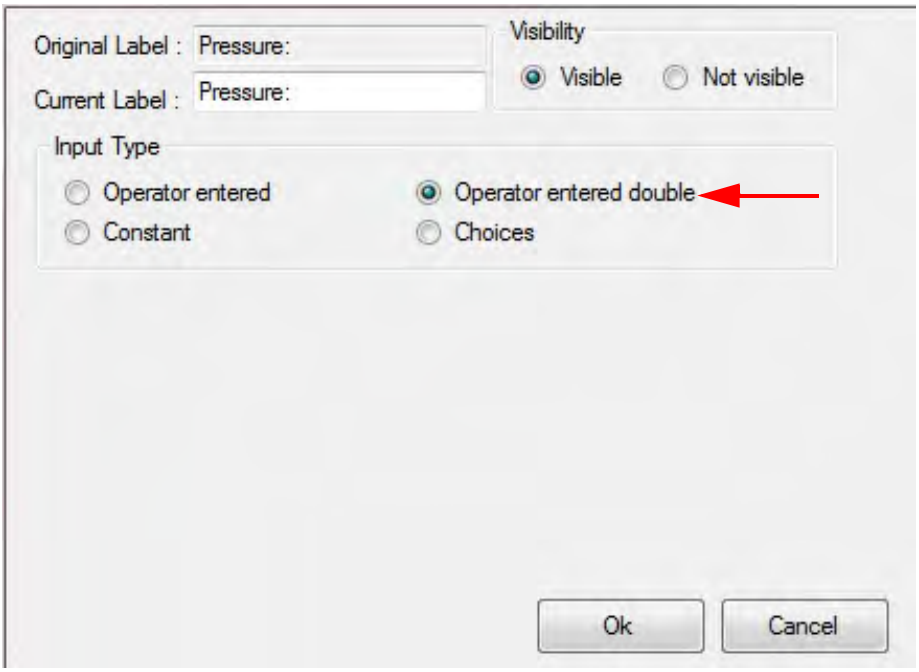
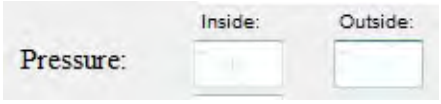


Figure 3.25

In the *Main Screen*, the *Pressure Label* will now appear with two text entry fields next to it:



Constant Input Type

When Constant is selected, an Input Choices section appears in the *Change Data* form. This allows the supervisor to set the field data at a constant value that cannot be changed by the operator.

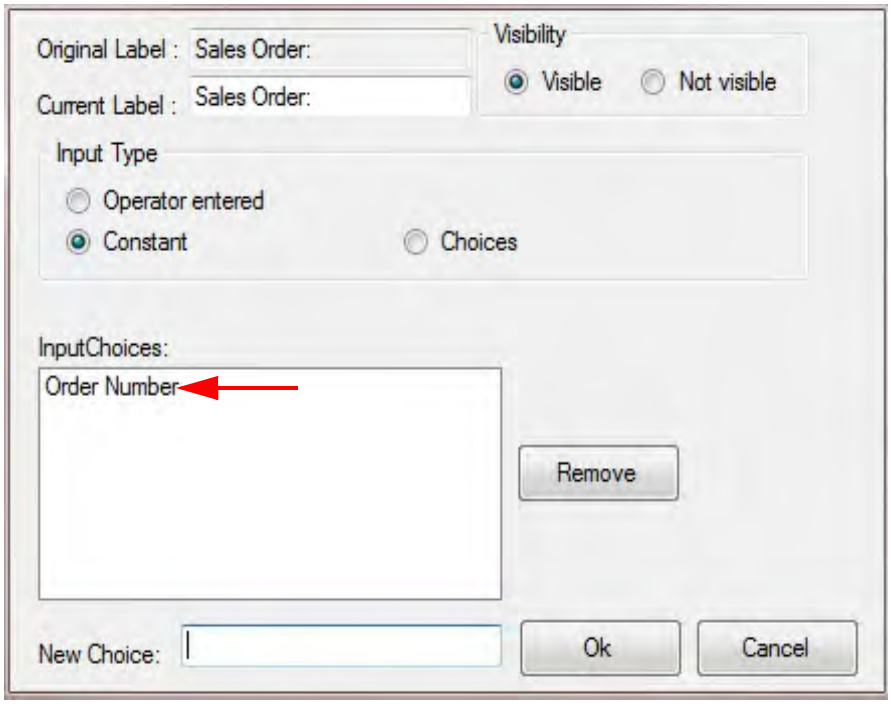
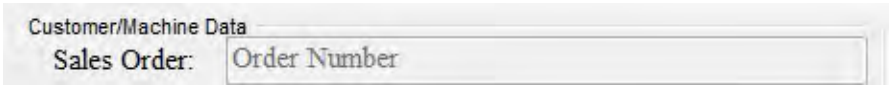


Figure 3.26

Enter the desired text in the **New Choice** field at the bottom of the screen, then press the Enter key. The text will now appear in the Input Choices section.

To change the Input Choice, select the current choice and click **Remove**. Then enter the desired data in the New Choice field and press the **Enter** key. Click **OK** to close the *Change Data Form* and return to *Supervisor Settings*.

When a Constant input type has been selected, the field will display the information that was preset in the *Change Data* screen. The field will appear greyed out in the *Main Screen*, indicating it cannot be edited.



Choices Input Type

When Choices is selected, an Input Choices section appears in the *Change Data* form. This allows the supervisor to create a selection drop box for the field.

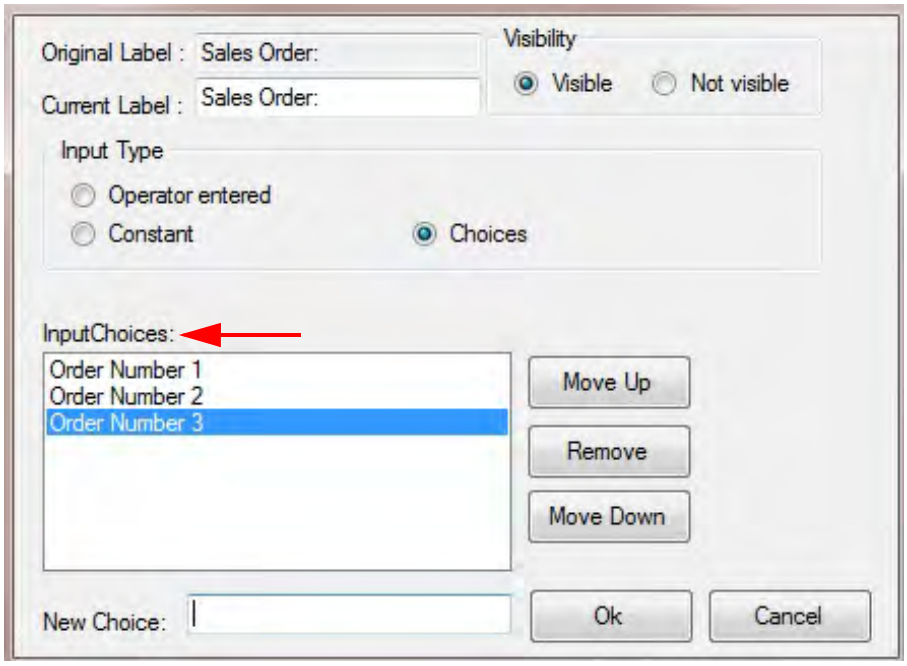


Figure 3.27

To create a drop-down option, enter the desired text in the **New Choice** field at the bottom of the screen, then press the **Enter** key. The new option will now appear in the Input Choices section.

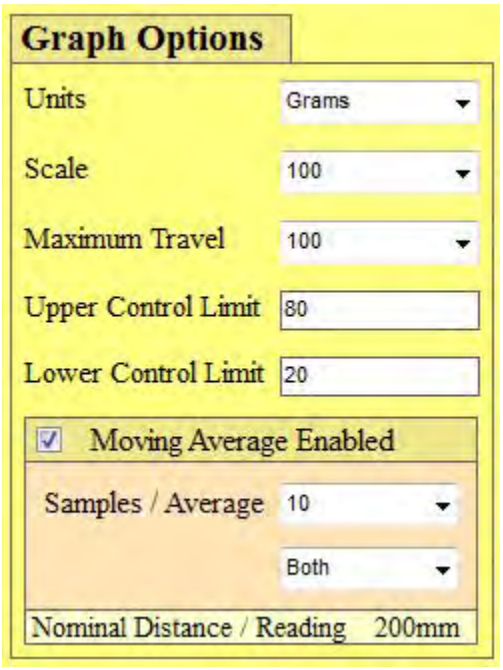
To change the order of appearance for the Input Choices options, select a choice then click the **Move Up** or **Move Down** buttons until the choice is in the desired location.

Supervisor Settings

The Supervisor Settings section allows the operator to customize Saving, Test and Graph options and to change passwords.

GRAPH OPTIONS

The *Graph Options* section determines how the Peel Test Chart in the Main Screen will function.



Units

The Units menu allows the operator to select between Grams and Newtons as units of measure on the Peel Force Chart in the *Main Screen*.

Scale

The Scale menu determines how the Y axis on the *Peel Force Chart* is configured. It can be set for 100 or 200 grams or 1-4 Newtons depending on the unit of measure that was selected in the Unit menu.

Maximum Travel

Maximum Travel determines how many millimeters the *Pull Test Graph* in the *Main Screen* will display. There are three setting options for travel distance: 100 mm, 150 mm and 200 mm.

> **Note**: If a *Pull Length* value of 0 is entered in the *Main Screen Settings* field, the pull length will be the maximum distance of 200mm.

Upper/Lower Control Limit Fields

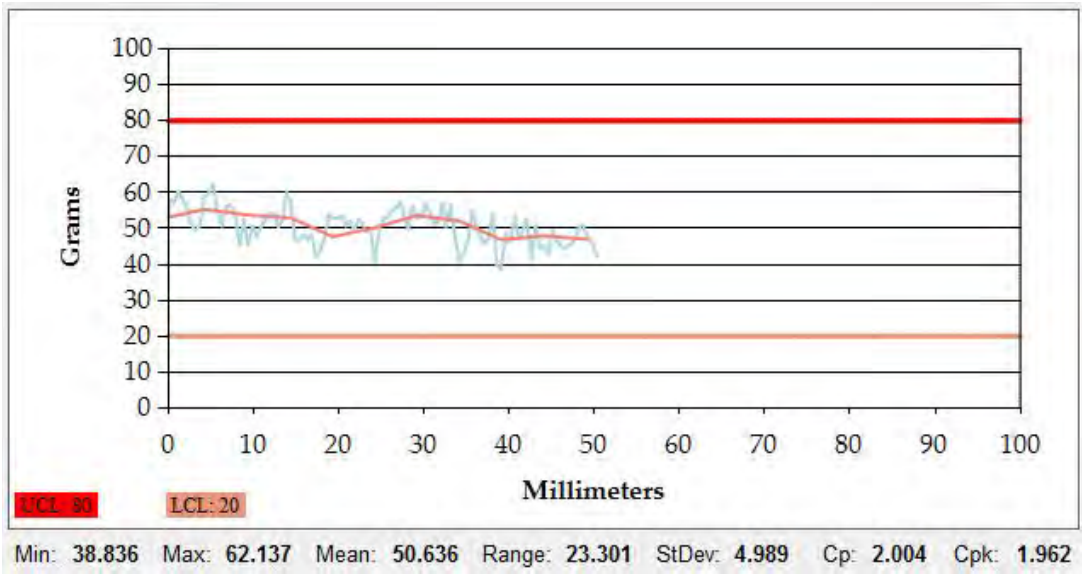
Enter the **Upper Control Limit (UCL)** and the **Lower Control Limit (LCL)** in the fields shown on the right. Test results that are between the UCL and LCL will be considered *PASS* results. Test results that are higher than the UCL or lower than the LCL will be considered *FAIL* results.

The UCL and LCL numbers entered must be between 0-100 when **Scale** is set to 100 and 0-200 when **Scale** is set to 200.

Moving Average

When *Moving Average* is **Disabled**, the *Pull Test Graph* in the *Main Screen* will display a graph of the individual readings taken during the test. When all readings are between the Upper and Lower Control Limits, the test result will be **PASS**. If any reading exceeds those limits, the test result will be **FAIL**.

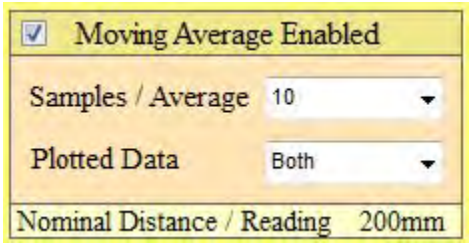
When *Moving Average* is **Enabled**, the PT-55 will calculate a moving average based on a preset number of sample readings. The *Pull Test Graph* in the *Main Screen* can now display a graph with either the raw individual readings (**blue**) or the Moving Average (**pink**) or both.



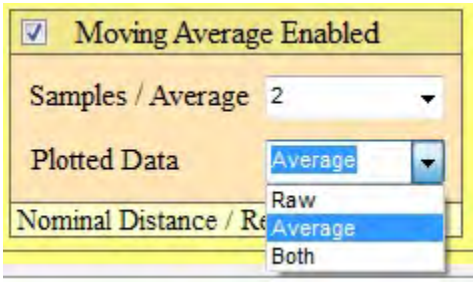
When the *Moving Average* is between the upper and lower control limits, the test result will be **PASS**. If the *Moving Average* exceeds those limits, the test result will be **FAIL**.

> **Note:** If the *Moving Average* is between the preset upper and lower limits but the individual readings exceed those limits, the test result will still be **PASS**.

When Moving Average is enabled, the user must select the number of **Samples/Average**. This can be set from *2-10*.

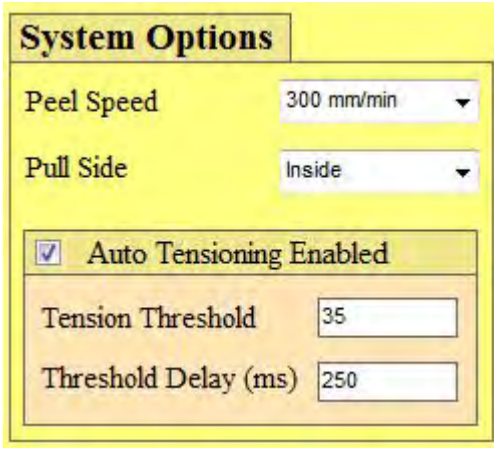


The **Plotted Data** field allows the user to choose what data appears in the *Main Screen* graph when a test is run. The options are *Raw* (individual test readings), *Average* and *Both*.



SYSTEM OPTIONS

The *Test Options* section is used to configure the peel force test settings.



Peel Speed

Peel Speed indicates the speed that the carriage will move at during a pull test. There are two options: 300 mm/min and 120 mm/min.

Pull Side

Pull Side indicates where the alligator clip and load cell are positioned in relation to the cover tape. There are three Pull Side options: *Inside, Outside, Center*.

While most tests will center the load cell on the cover tape to test both sides of the seal, it is possible to slice the cover tape down the middle and then position the load cell on either the left or right side of the tape to test the seal on that specific side.

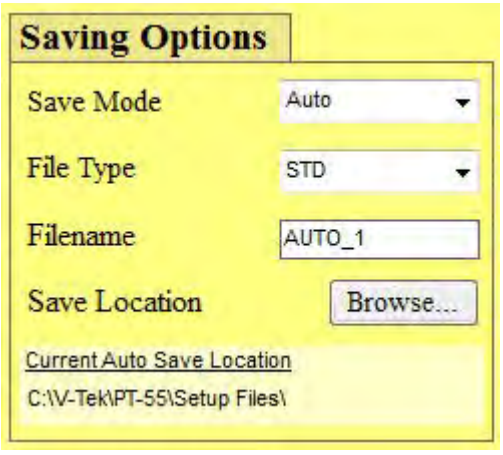
Auto Tension Options

The auto tension feature eliminates having to jog the tape to apply pressure when starting a peel force test. When auto tension is selected and a value is entered, the peel force graph will wait until the auto tension value is reached. After this, it will reset the graph and will start plotting the peel force test.

The **Auto Tension Checkbox** default setting is **ON** (checked). The **Auto Tension Value** is the tension applied to the cover tape by the load cell. It should be set slightly higher than the *Lower Control Limit*. The **Auto Tension Delay** is the time in milliseconds from which the carriage assembly starts moving and when the graph starts plotting.

SAVING OPTIONS

The *Saving Options* section is used to configure the save settings.



Save Mode

The auto save feature allows the user to select between three types of saving options; **Manual**, **Auto**, and **Sales Order.**

In **Manual** save mode, the operator must manually press the **Save File** button each time a save is desired. In **Auto Save** mode, a peel force test is automatically saved to a specific file name and location once the test is completed. In **Sales Order** mode, the file is saved to a specific location under the sales order number.

Note: The default auto save location is **C:\V-TEK\PT-55\Setup Files**. This directory is created upon the initial load of the software.

File Type

The *File Type* section is used to determine which file type the Auto Save will be exported as. There are three options: **STD** (Standard), **MAF** (Moving Average File) and **CSV** (Comma Separated Values format). The **Standard** file type is a simple text file. The ***.csv** and ***.maf** file type can be exported into an Excel spreadsheet for a printed report. See *Creating a *.csv Export File* and *Creating a *.maf Export File* at the end of this chapter for further information.

Filename

The *File Name* field is a text field which allows the user to enter a unique file name.

> **Note:** If *Auto Save Mode* or *Auto - Sales Order Mode* are selected, the date and time in 24 hour format of the save will automatically be appended to the *File Name*. For example, if the user enters a file name of "My File" in *Auto Save Mode* and the file is auto-saved at 4:40.30 PM on October 22, 2014, the *File Name* will be **My File_2014.10.22_16.40.30**. Similarly if *Auto-Sales Order Mode* is selected and the file for Sales Order #1234567 is saved at the same date and time, the *File Name* will be **1234567_2014.10.22_16.40.30**.

Change Save Location

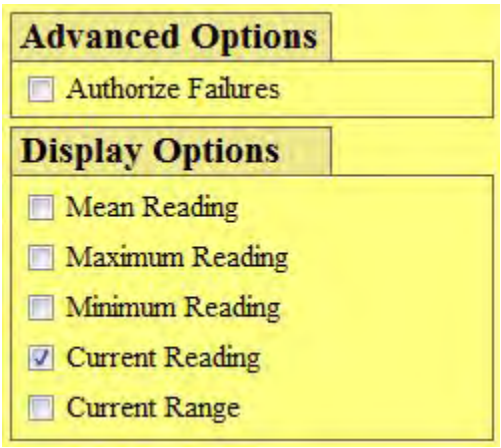
Clicking the **Browse** button allows the operator to browse through folders and select an auto save location.Choose a location and click on **OK**. The *Current Auto Save Location* is displayed below the **Browse** button.

ADVANCED OPTIONS

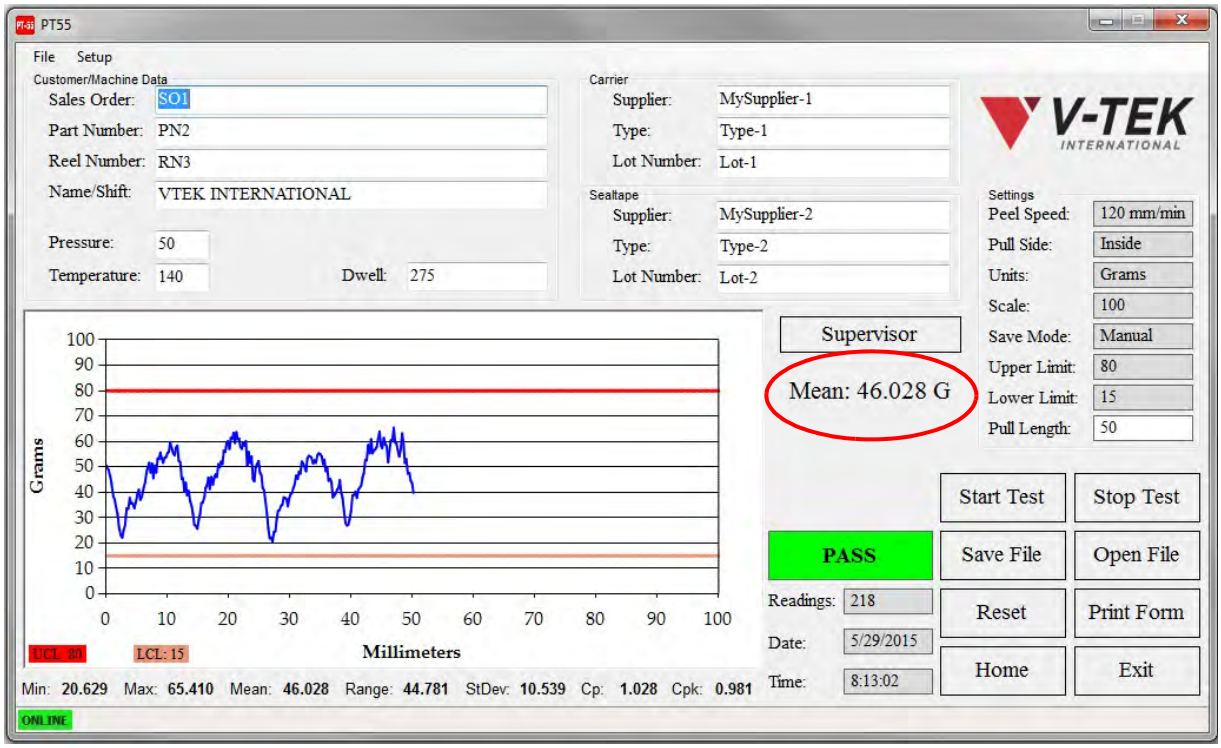
If *Authorize Failures* is checked, anytime a peel test fails the PT-55 will stop, the buttons in the *Main Screen* will become inactive and the **Supervisor** button will flash red once the PT-55 is stopped or the test is complete. Normal operation can only resume after the *Supervisor Password* is entered.

DISPLAY OPTIONS

Display options allows the user to select what test results will be highlighted in the Main Screen at the conclusion of a pull test. The options are *Mean Reading, Maximum Reading, Minimum Reading, Current Reading* and *Current Range*.

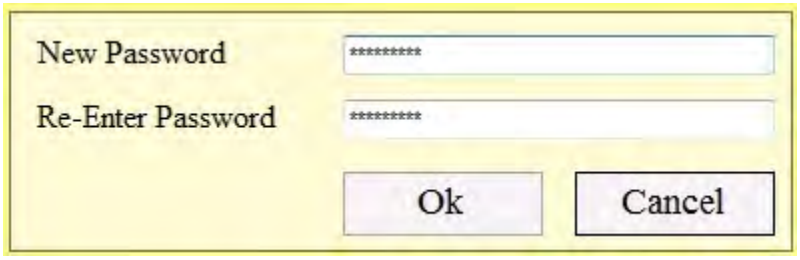


In the example on the above, *Mean Reading* has been selected. With this option selected, the *Main Screen* will appear as below following a test. Note the *Mean Reading* now appears beneath the **Supervisor** button.



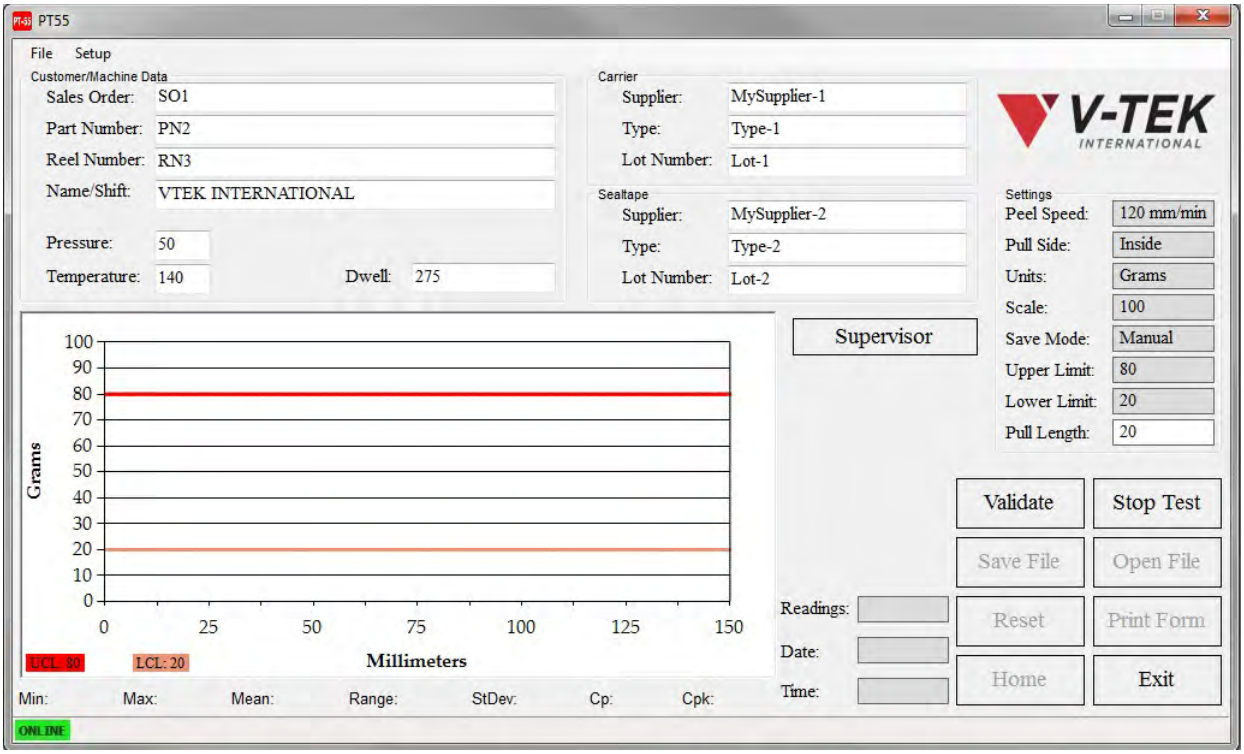
SUPERVISOR BUTTONS

Pressing the **Change Password** button will open the Change Password Screen.



Pressing the **Calibrate** button will place the PT-55 in *Calibration Mode*, homing the motor and then leading the operator through the calibration process. See Chapter 4 for a detailed description of the calibration process.

Pressing the **Validate** button will place the PT-55 in *Validation Mode* which verifies calibration accuracy. See Chapter 4 for a detailed description of the validation process.



Save Supervisor Settings

Once the *Supervisor Settings* screen is configured as desired, click **Save & Exit** to save the settings and return to the *Main Screen*.

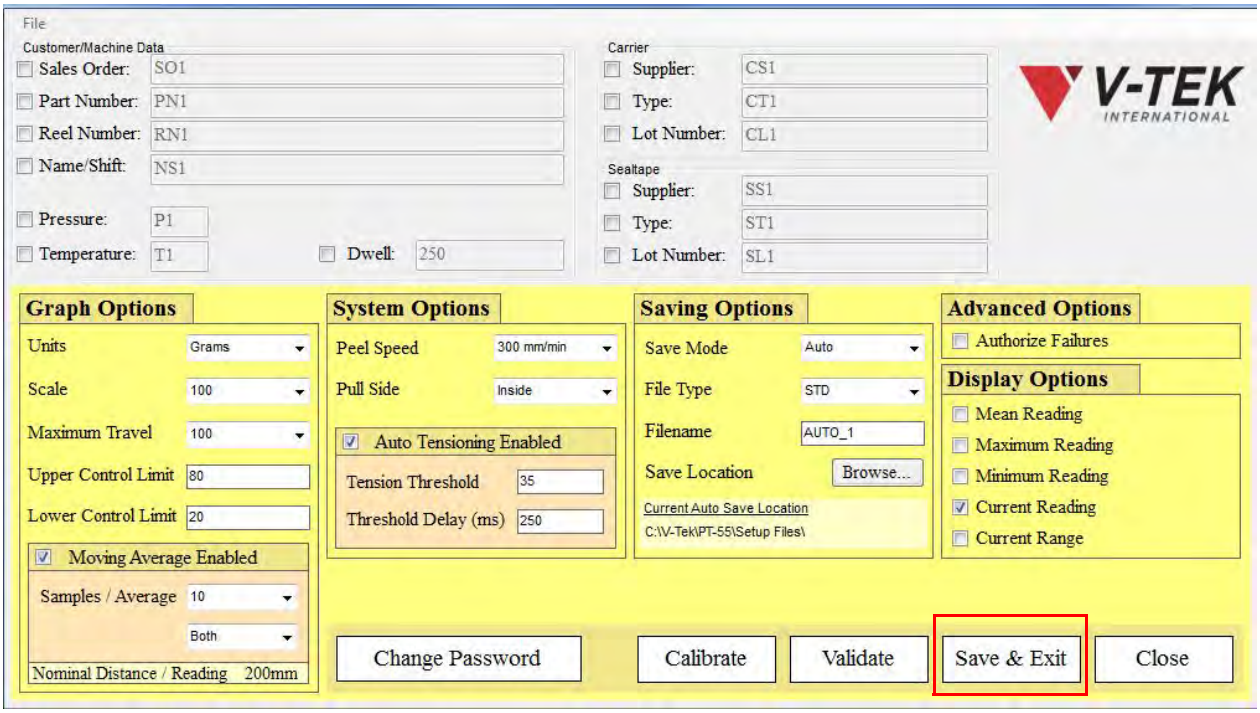


Figure 3.28

Configuring & Running a Peel Test

Note: For information on machine setup and loading tape, see *Chapter 2: Setup*.

For information on configuring the *Main Screen* fields, see the previous sections in this chapter.

1. Start the application by double clicking the **PT-55 Software** icon.

The *Main Screen* will open.

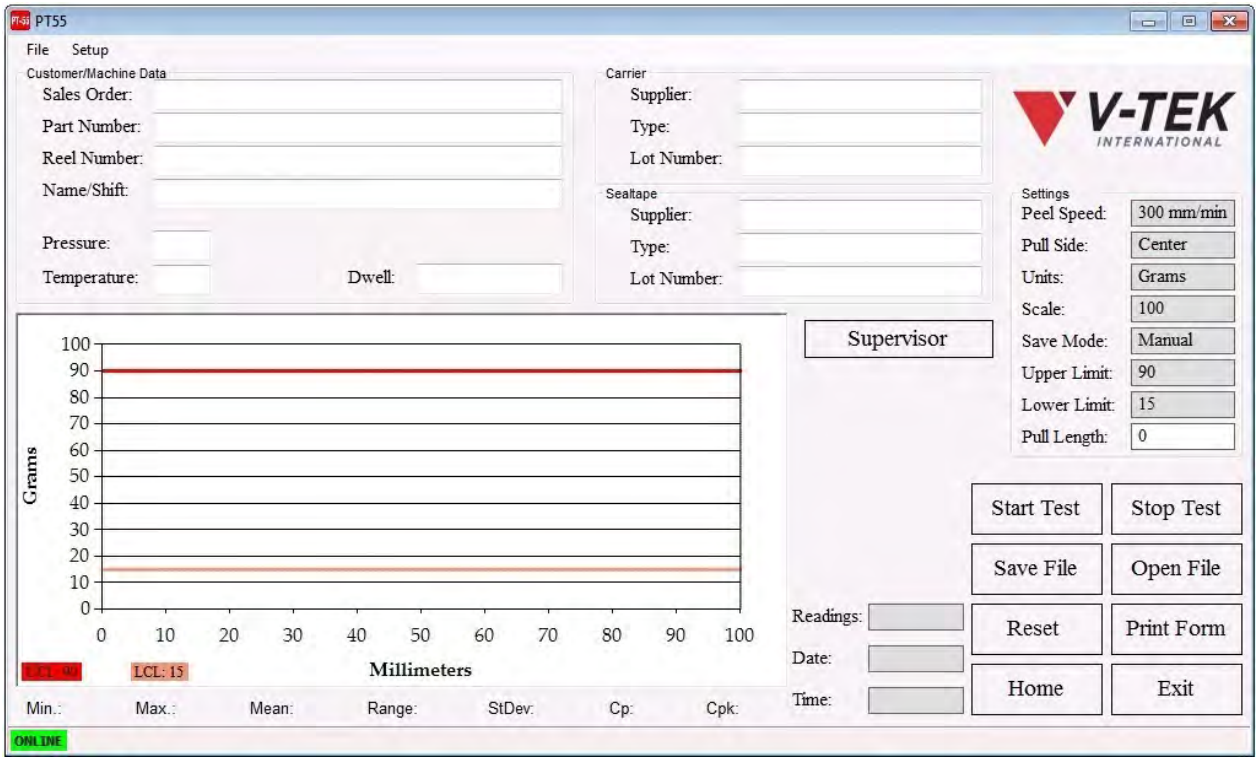


Figure 3.29

2. Complete the *Customer/Machine Data* fields for **Name, Part Number, Reel Number, Name/ Shift,** and the **Temperature, Pressure,** and **Dwell Time** used to create the seal being tested.

Figure 3.30

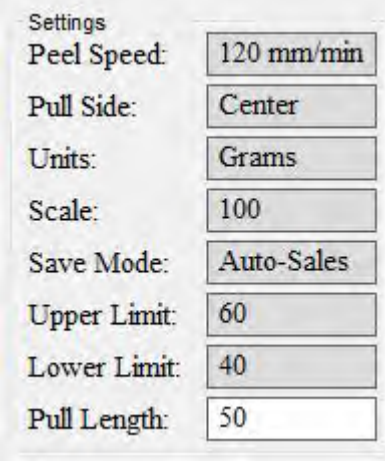
3. Enter carrier tape information in the *Carrier* fields for **Supplier, Type,** and **Lot Number**.

Figure 3.31

4. Type in the *Sealtape* fields for **Supplier, Type,** and **Lot Number**.

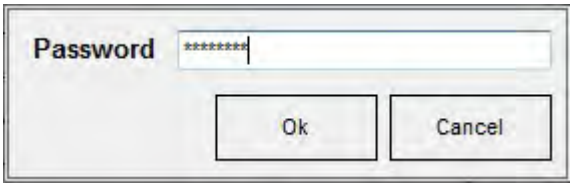
Figure 3.32

5. Enter the *Peel Test Settings*. These are set in the *Supervisor Settings* screen.



Click the **Supervisor** button to access the *Password Input* screen and open *Supervisor Settings*.

The *Password Input* screen will appear. Enter the password at the prompt and click **OK**.



Note: The default password is “password”.

6. After the correct password is entered, the *Supervisor Settings* screen will appear. Adjust settings as needed for the current job, then click **Save & Exit**.

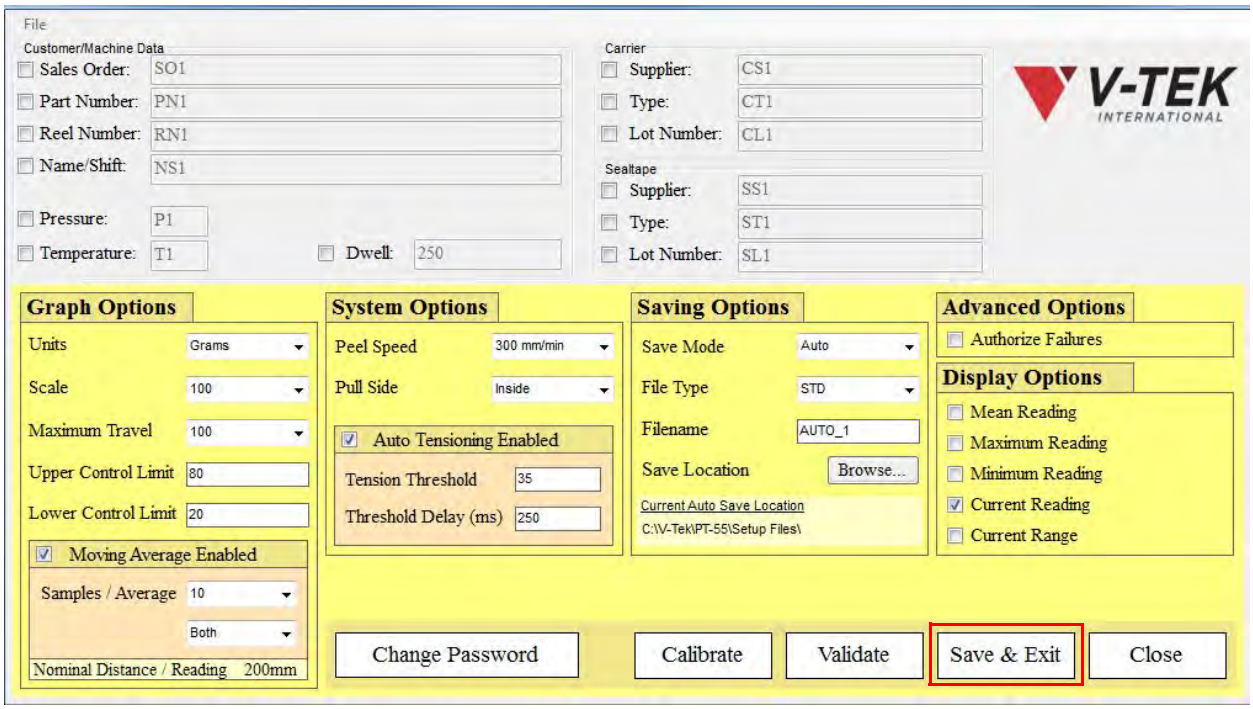


Figure 3.35

7. In the *Main Screen*, type in the desired pull length in the *Pull Length* field. *Pull Length* should be set between 0-200 mm.

   Note: If the *Pull Length* is set to 0, the pull test will default to the *X Axis Maximum* which was set in the *Supervisor Settings* screen. If the *X Axis Maximum* setting is different than the *Pull Length* setting, the pull test will stop at whichever length is shortest.

8. Click the **Save File** button to create a *Master Form*, if desired.

   Note: for more details on creating a Master Form, proceed to the next section in this chapter.

9. Ensure sealed tape sample is loaded properly and carriage is in the **Home** position.

Figure 3.36

10. Click the **Start Test** button to begin the peel force test. Test results will be displayed on the *Peel Force Test Graph* and in the fields below the graph.

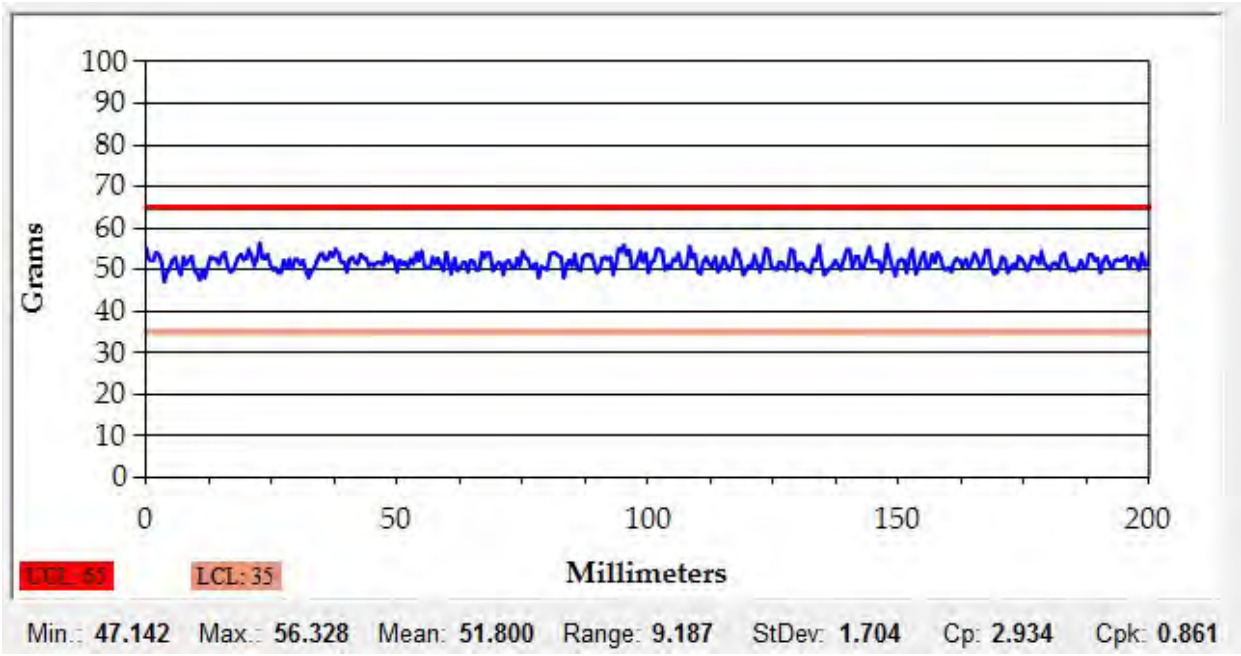


Figure 3.37

11. Click **Stop Test** to end the test at any point, or simply wait for test to complete itself.

12. A **PASS** or **FAIL** message will appear at the bottom of the *Main Screen.*

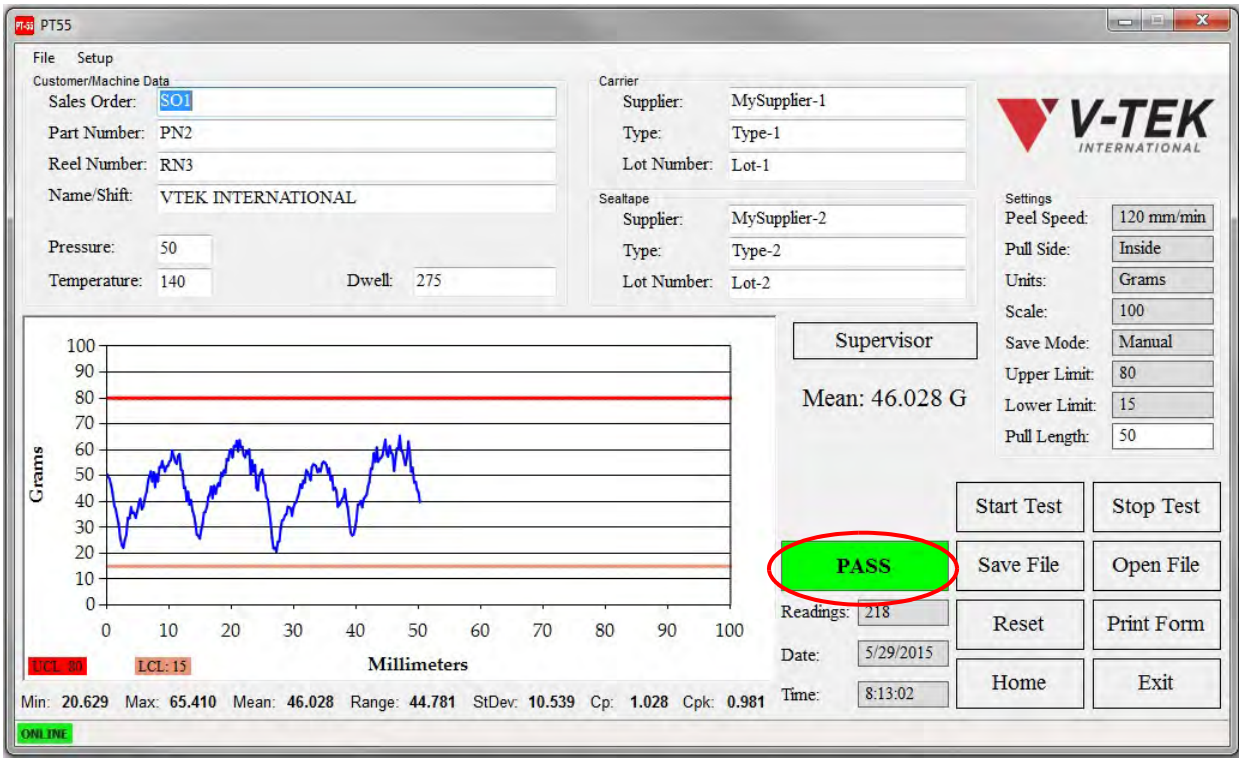


Figure 3.38

13. After the pull test is complete it may be saved or printed using the buttons on the bottom corner of the *Main Screen*. Other options include resetting the test so it can be run on a second sample, homing the carriage or opening a new file.

Figure 3.39

Master Forms

If the same parts and testing parameters are to be used repeatedly, a master form can be created so that the parameters do not have to be re-entered each time they are used. Multiple forms can be created and stored if desired.

Creating a Master Form

1. Start the PT-55 software by double-clicking the PT-55 icon. The *Main Screen* will open.

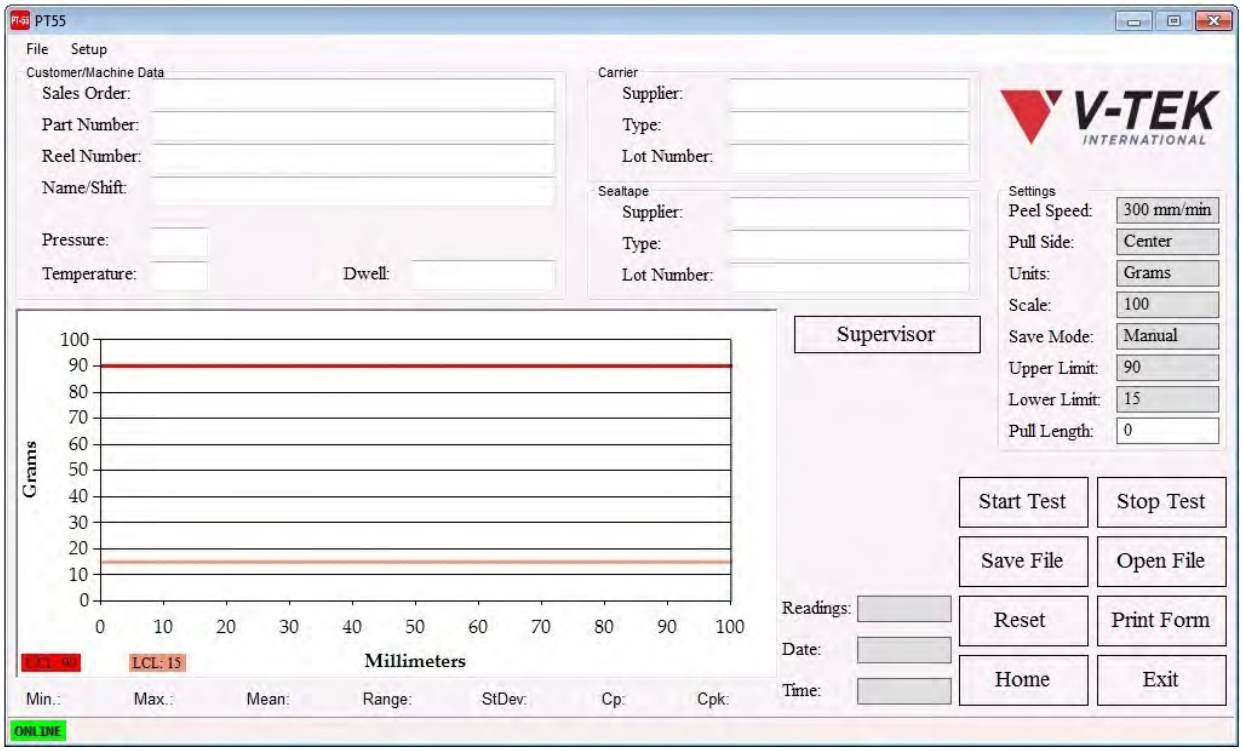
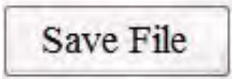


Figure 3.40

2. Fill out all the appropriate information and set all the parameters to be used.

3. Click on the **SAVE FILE** button.



4. The *Save* screen will open..

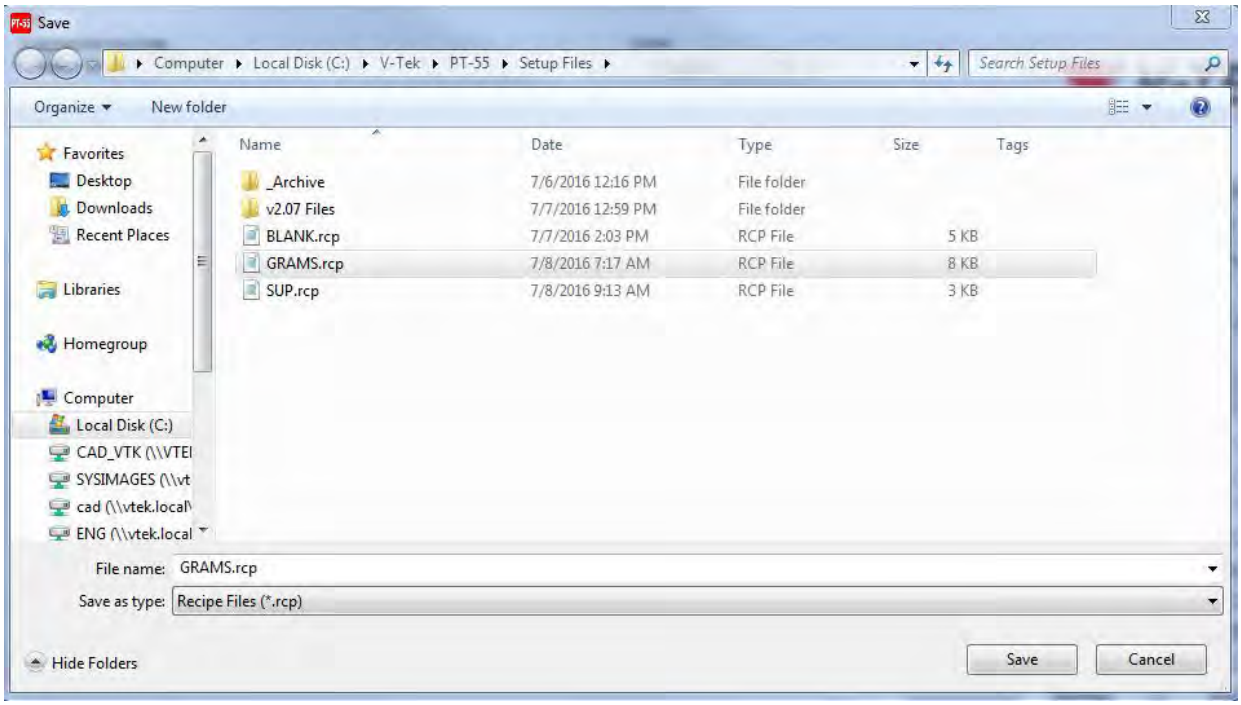


Figure 3.41

5. Enter a file name and press **SAVE**.

6. To retrieve the master form later, click ***Open File*** and select the desired file. A new test can now be run using the previously entered and saved test parameters.

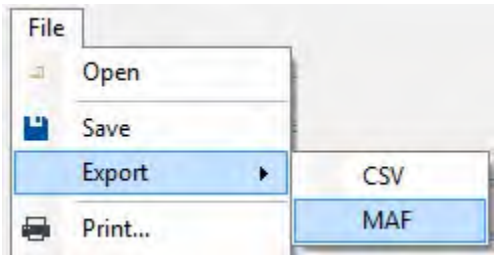
Creating an *.csv Export File

After the desired data has been set in the user fields and a test has been performed, the PT-55 Software can save test data to a **Comma Separated Value (.csv)** format. This file is an Excel compatible data file which may be used to create a spreadsheet which can then be customized as desired.

The following information is stored in each record:

- Customer/Machine data
- Carrier Tape data
- Seal Tape data
- Peel Test statistics
- Peel Test results (Travel vs. Measured Force)

1. Click **File > Export > CSV**.



2. Enter the file name and location, then click **Save**.

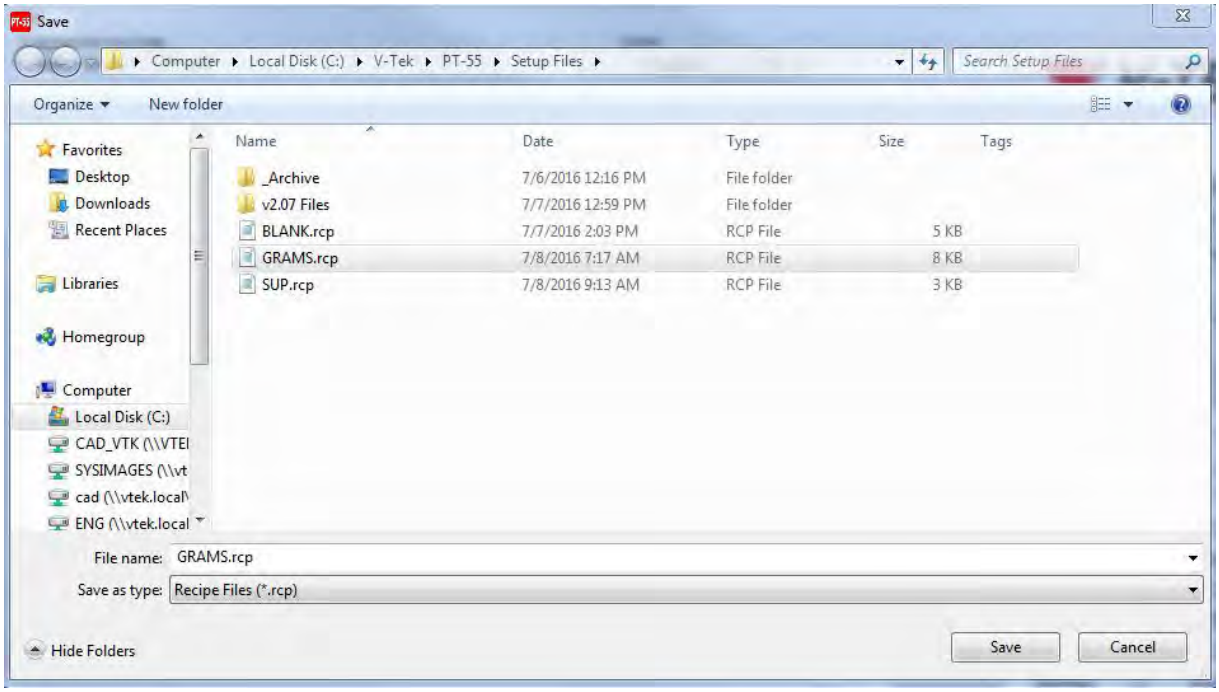


Figure 3.42

Note: The default location is C:\V-TEK\PT-55\Setup Files.

3. The peel force test results will be saved to a **Comma Separated Value** (.csv) format. This document can be opened in a text file reader such as WordPad or imported into an Excel Spreadsheet. A sample .csv text file is pictured below..

Date: 7/8/2016	**Time: 8:00:17 AM**	**Result: PASS**
Customer / Machine Data		
Sales Order:	OE_SO	
Part Number:	OE_PN	
Reel Number:	OE_RN	
Name/Shift:	OE_NS	
Pressure: (Inside:)	Pin	
Pressure: (Outside:)	Pout	
Temperature: (Inside:)	Tin	
Temperature: (Outside:)	Tout	
Dwell:	OE_DW	
Carrier		
Supplier:	OE_CS	
Type:	OE_CT	
Lot Number:	OE_CL	
Sealtape		
Supplier:	OE_SS	
Type:	OE_ST	
Lot Number:	OE_SL	
Statistics		
UCL	60	
LCL	40	
Min	38.836	
Max	63.836	
Mean	51.047	
Range	25	
Standard Deviation	3.767	
Cp	0.885	
Cpk	0.792	
Chart Data		
Travel (mm)	**Measured Force (Grams)**	
0	51.69989497	
0.36	51.21444994	
1.005	52.4280625	
1.625	50.00083739	
2.065	51.94261748	
2.665	47.81633478	
3.235	51.45717246	
3.74	56.06890018	
4.345	52.91350753	
4.905	51.21444994	
5.55	50.97172743	
5.98	54.12712008	
6.595	50.2435599	

Figure 3.43

Note: *.csv data will vary depending on the *Supervisor Settings* that have been selected.

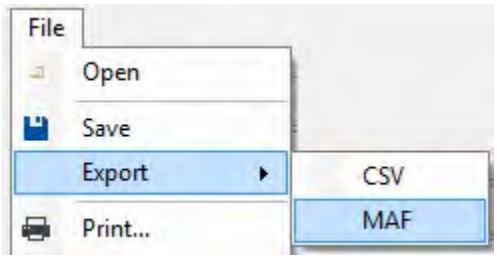
Creating an *.maf Export File

After the desired data has been set in the user fields and a test has been performed, the PT-55 Software can save test data to a **Moving Average File (.maf)** format. This file is an Excel compatible data file which may be used to create a spreadsheet which can then be customized as desired.

The following information is stored in each record:

- Customer/Machine data
- Carrier Tape data
- Seal Tape data
- Peel Test statistics
- Peel Test results (Reading, Travel, Measured Force and Moving Average)

1. Click **File > Export > MAF**.



2. Enter the file name and location, then click **Save**.

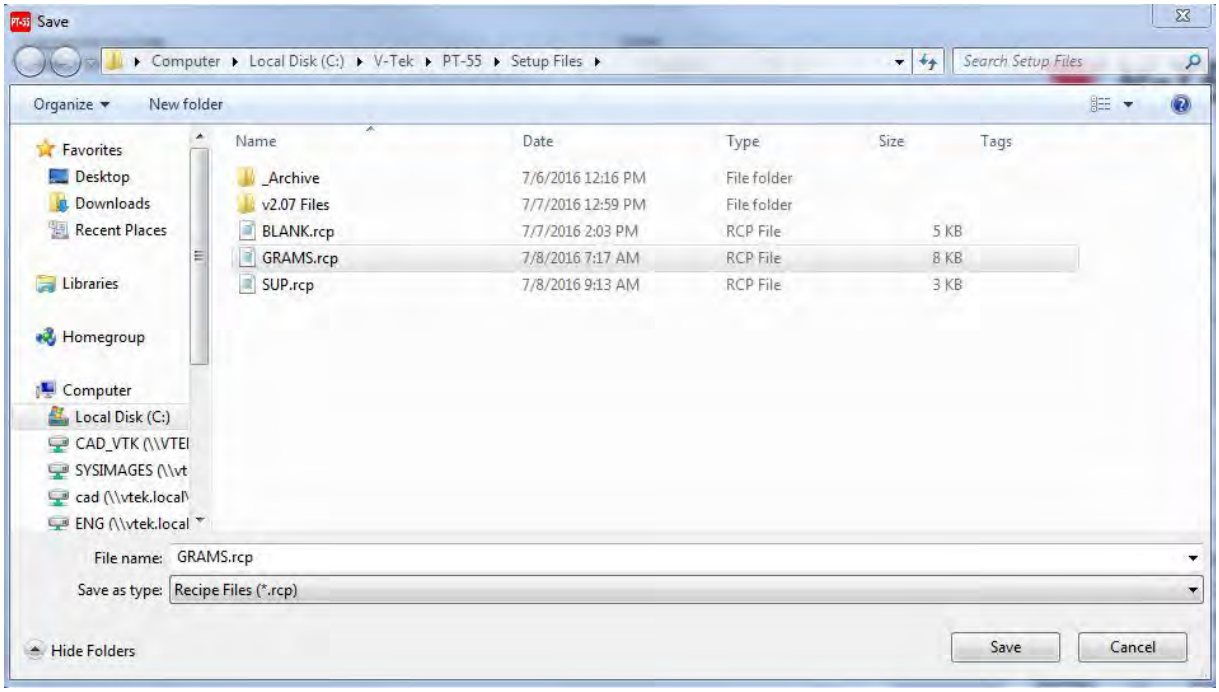


Figure 3.44

Note: The default location is C:\V-TEK\PT-55\Setup Files.

3. The peel force test results will be saved to a **Moving Average File** (.maf) format. This document can be opened in a text file reader such as WordPad or imported into an Excel Spreadsheet. A sample .maf text file is pictured below.

Date: 7/8/2016	**Time: 8:00:12 AM**	**Result: PASS**			
Customer / Machine Data					
Sales Order:	OE_SO				
Part Number:	OE_PN				
Reel Number:	OE_RN				
Name/Shift:	OE_NS				
Pressure: (Inside:)	Pin				
Pressure: (Outside:)	Pout				
Temperature: (Inside:)	Tin				
Temperature: (Outside:)	Tout				
Dwell:	OE_DW				
Carrier					
Supplier:	OE_CS				
Type:	OE_CT				
Lot Number:	OE_CL				
Sealtape					
Supplier:	OE_SS				
Type:	OE_ST				
Lot Number:	OE_SL				
Statistics					
UCL	60				
LCL	40				
Min	38.836				
Max	63.836				
Mean	51.047				
Range	25				
Standard Deviation	3.767				
Cp	0.885				
Cpk	0.792				
Reading	**Travel (mm)**	**Force(Grams)**	**Moving Average**		
1	0	51.69989497			
2	0.36	51.21444994			
3	1.005	52.4280625			
4	1.625	50.00083739			
5	2.065	51.94261748			
6	2.665	47.81633478			
7	3.235	51.45717246			
8	3.74	56.06890018			
9	4.345	52.91350753			
10	4.905	51.21444994	51.67562272		
11	5.55	50.97172743			
12	5.98	54.12712008			
13	6.595	50.2435599			
14	7.22	47.81633478			
15	7.66	48.78722483			
16	8.255	49.51539236			

Figure 3.45

Note: *.maf data will vary depending on the *Supervisor Settings* that have been selected.

Customizing the Main Screen Logo

The V-TEK logo on the *Main Screen* can be replaced with a customer's own logo. This may be desirable if peel test results are being printed directly from the screen and sent to customers.

To insert a different logo into the field currently occupied by the V-TEK logo on the *Main Screen,* follow the steps below.

1. Find an appropriate bitmap logo file.

2. Rename the logo **comlogo.bmp.**

3. Save the new file in **C:\V-TEK\PT-55**

Note: The maximize size of the logo bitmap is 2.5" wide and 0.5" high.

Additional Notes

Thank you for purchasing this equipment and software from V-TEK, Inc. If you experience any difficulties with the machine or software, please feel free to call your V-TEK representative.

Chapter 4: Maintenance & Calibration

Contents

Recommended Maintenance

V-TEK recommends recalibrating the PT-55 every six months. The PT-55 laptop should be backed up periodically. No further maintenance is required.

As with any computer system, V-TEK, Inc. recommends users create a computer **Recovery Disk** prior to operation and conduct periodic back-ups as needed. Visit the computer manufacturer's website for instructions on creating a recovery disk. V-TEK, Inc. does not create or maintain recovery information for the PT-55 laptop. Creating a recovery disk is solely the users' responsibility.

If any problems are encountered while using the PT-55, contact your V-TEK service representative, referring to the Customer Service Contact sheet located at the back of this manual.

Speed Calibration

No advance speed calibration is necessary. Advance speeds are microprocessor controlled.

Accuracy & Calibration

The expected accuracy of the PT-55 is +/- 3.0 grams of the full scale value of the load cell. The load cell range is 0-200 grams.

Table 1: Load Cell Tolerances in Grams

Weight	Low Range	High Range
200	197	203
100	97	103
50	47	53
20	17	23
10	7	13

It must be noted that a number of factors can affect the accuracy of the system and cause the readings to differ from the factory calibrated values. Something as simple as how level the placement surface is may have an effect. Also, such things as rough handling of the load cell may have an effect. The load cell is a very sensitive device.

Note: Never pull on the chain by hand. Exceeding the cell's rated force can shift its output or even destroy it.

The PT-55 should arrive in good usable condition and provide an accurate and linear result. If the output values are slightly different than achieved at the factory, this should not be of concern. Tape peel forces are cyclic in nature, as evidenced by actual tests performed. A few grams difference is inconsequential as long as the system is linear and tracks properly. However, if maximum accuracy is desired, it will be achieved by calibrating the PT-55 in the exact position that it is going to be used in.

Calibration

Equipment Required:

- 50 gram weight
- 100 gram weight
- 200 gram weight

Figure 4.1

Note: Calibration weights sold separately.

Calibration Procedure

In the event that the load cell is replaced or if it is part of a maintenance routine, the load cell can be recalibrated by following the steps outlined.

Note: Once calibration has started, all calibration data will be lost and recalibrating is required.

1. From the *Main* screen, click the **Supervisor** button.

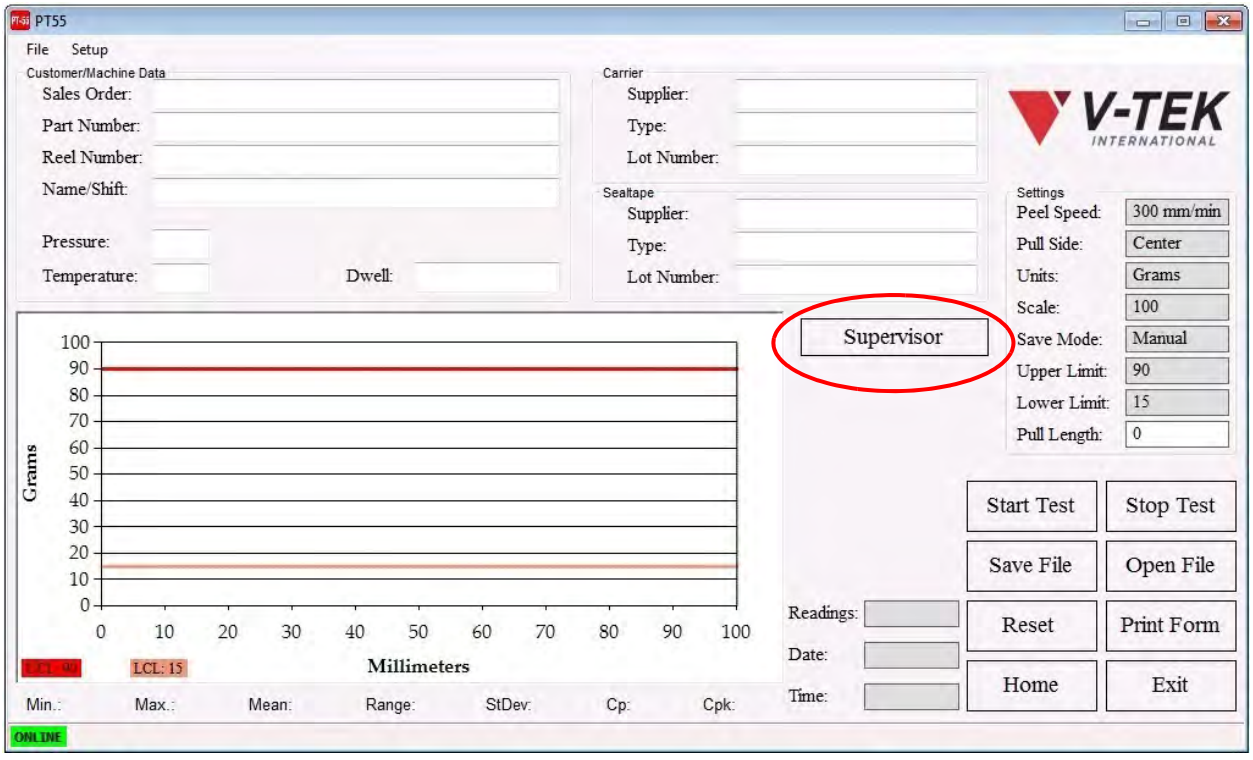


Figure 4.2

2. The *Password Input* screen will appear.. Enter the password at the prompt then click **OK**.

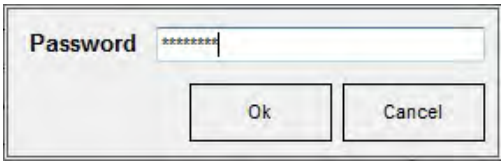


Figure 4.3

Note: The default password is: **password**.

3. The *Supervisor Settings* screen will open.

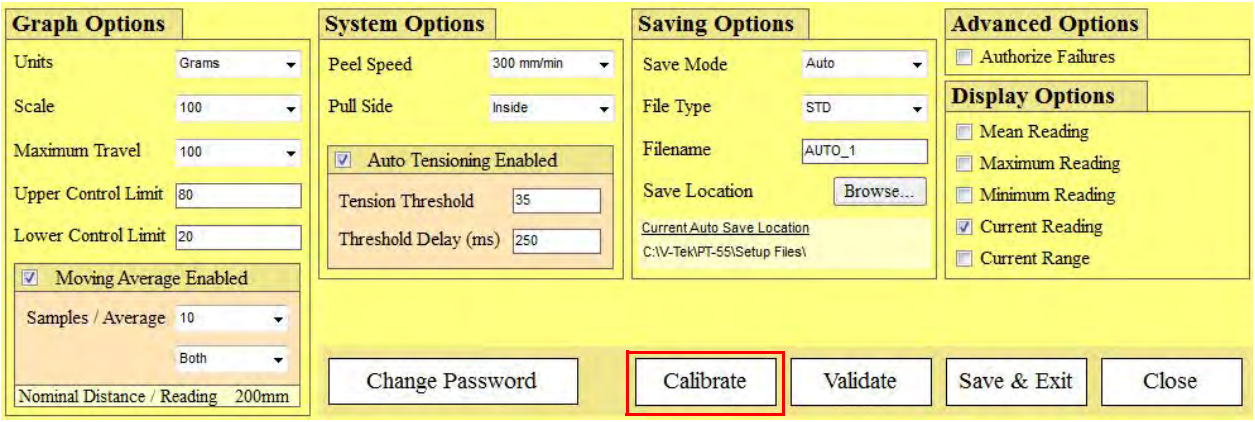


Figure 4.4

4. Click **Calibrate**. The following message will appear. Click **OK**.

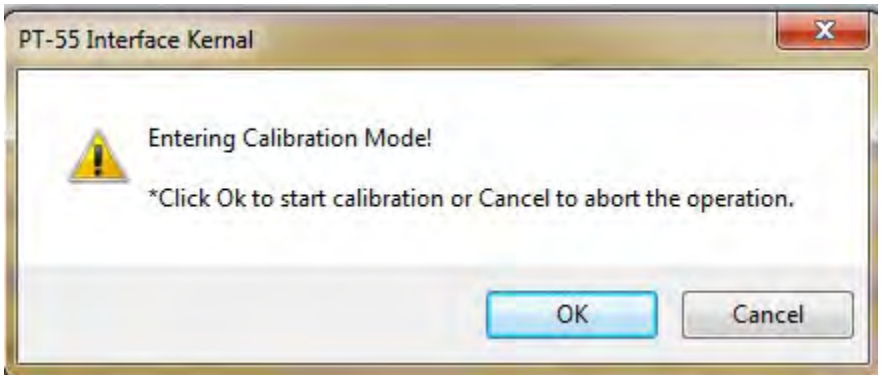


Figure 4.5

The carriage will automatically return home to its calibration position.

5. Follow the instructions that appear on the screen. The first is to remove any objects from the load cell clip..

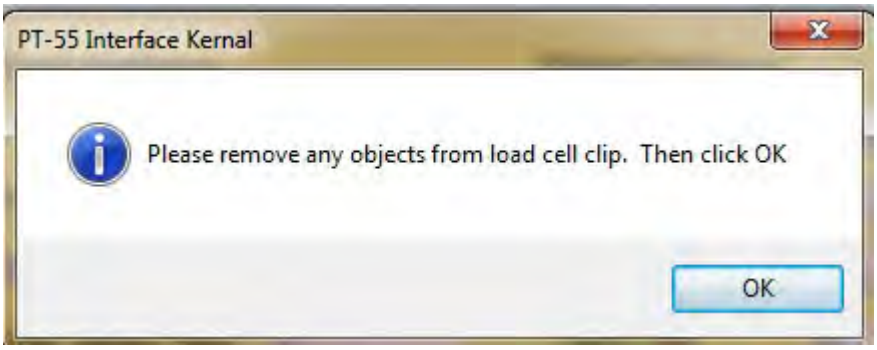


Figure 4.6

6. Once the load cell clip is empty, place the clip on top of the load cell to remove any downward force on the load cell. Click **OK**.

Figure 4.7

7. The next step is to hang a 50 gram weight over the calibration jig and connect it to the load cell clip.

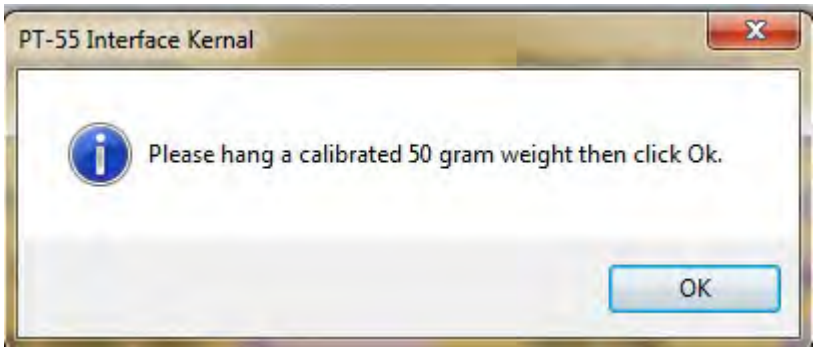


Figure 4.8

Ensure the weight is suspended from the center of the calibration jig bearing and is stabilized (not swinging) to ensure accurate calibration.

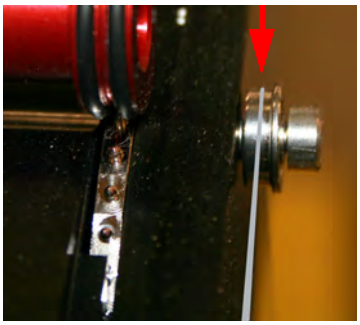


Figure 4.9

Note: Hang weights over the calibration jig in the front of the carriage assembly before connecting them to the load cell clip. **Never** hang weights without using the calibration jig. Hanging weights directly from the load cell may cause damage to the load cell.

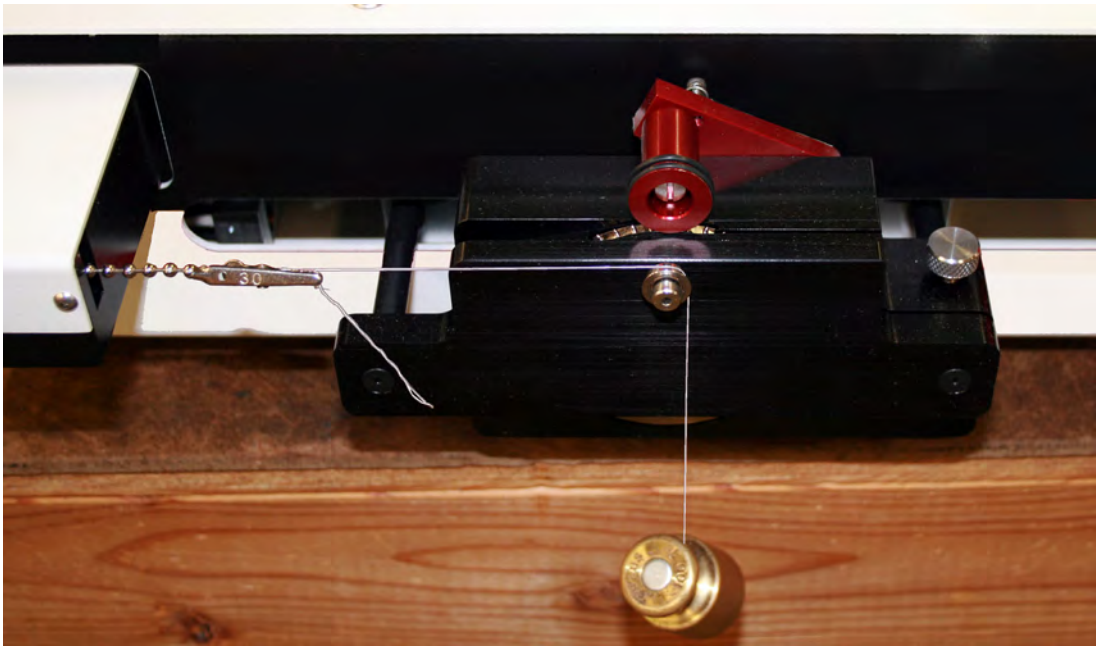


Figure 3.10

8. Repeat Step 7 with 100 gram and 200 gram weights, following the directions on the screen.

9. When calibration is complete, the *Supervisor Settings* screen will once again be accessible and a message will appear prompting to validate the calibration.

Verify Calibration Accuracy

1. Click **Validate** to verify the calibration..

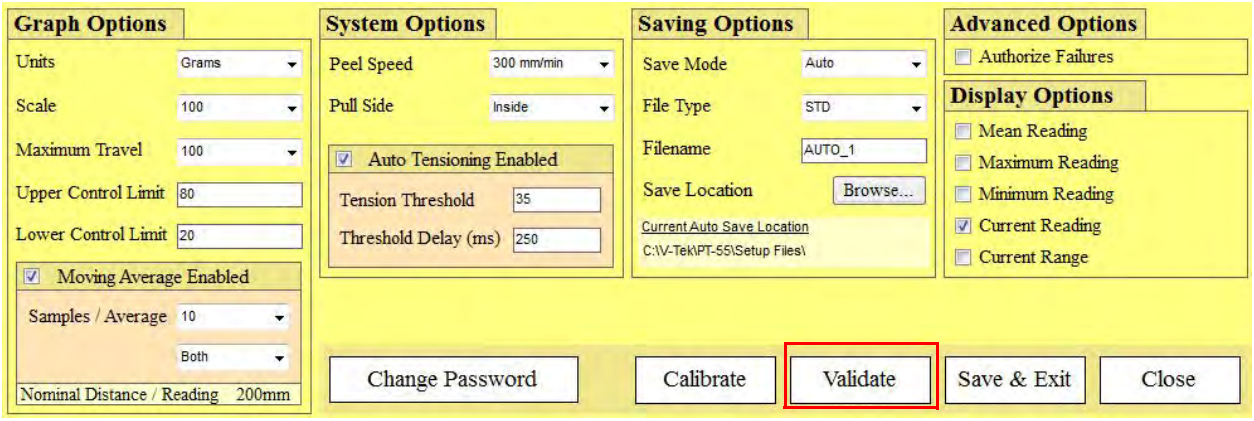


Figure 4.11

2. The following message will appear.

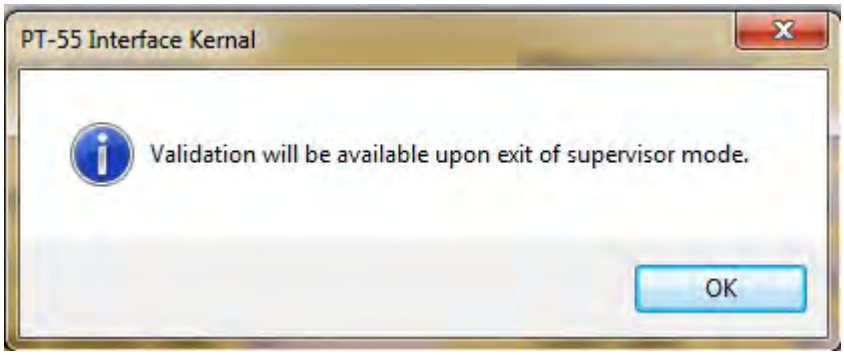
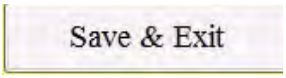


Figure 4.12

3. Click **OK**, then click **Save & Exit** to return to the *Main Screen*..



4. Note that the **Start Test** button has changed to a **Validate** button.

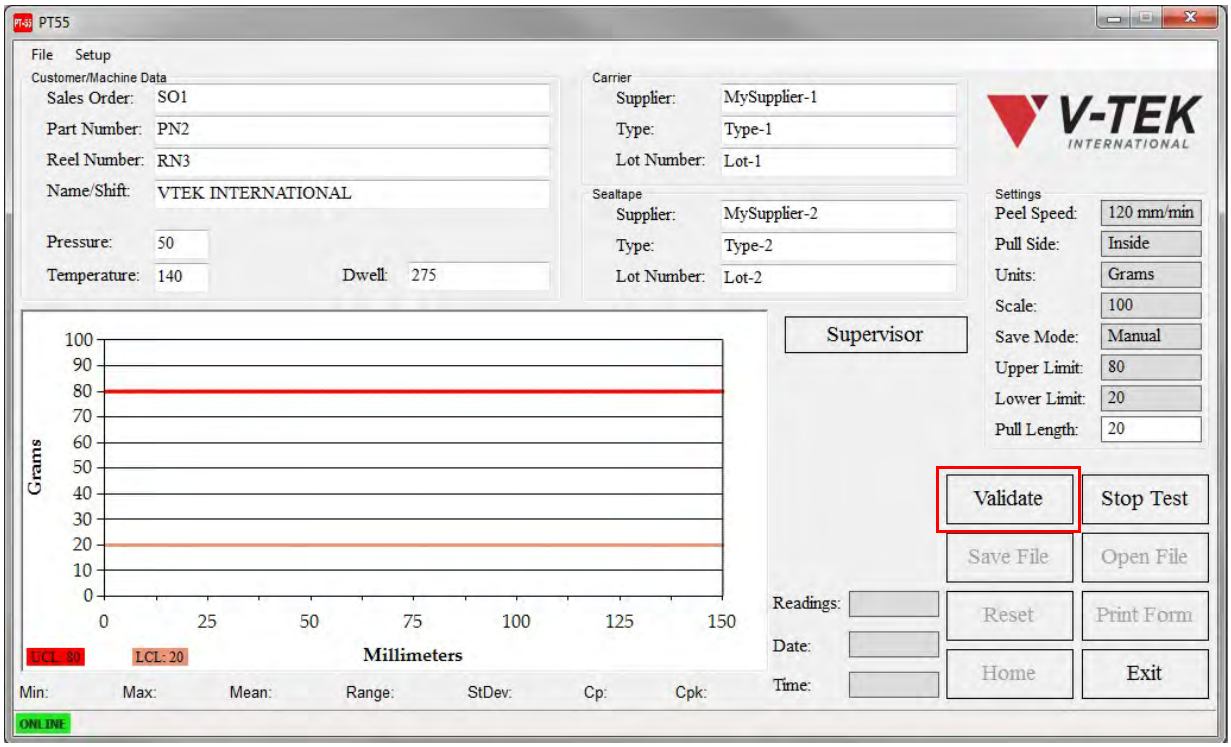


Figure 4.13

5. Ensure the carriage is in the home position, then hang a 50g or 100g weight from the load cell, suspending it over the calibration jig just as it was during the calibration process.

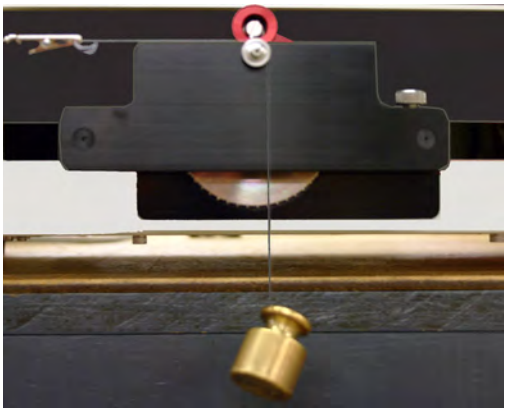


Figure 3.14

6. Click the **Validate** button.The PT-55 will begin the validation test.

Observe the graph results and readings to the right of the graph and below it.

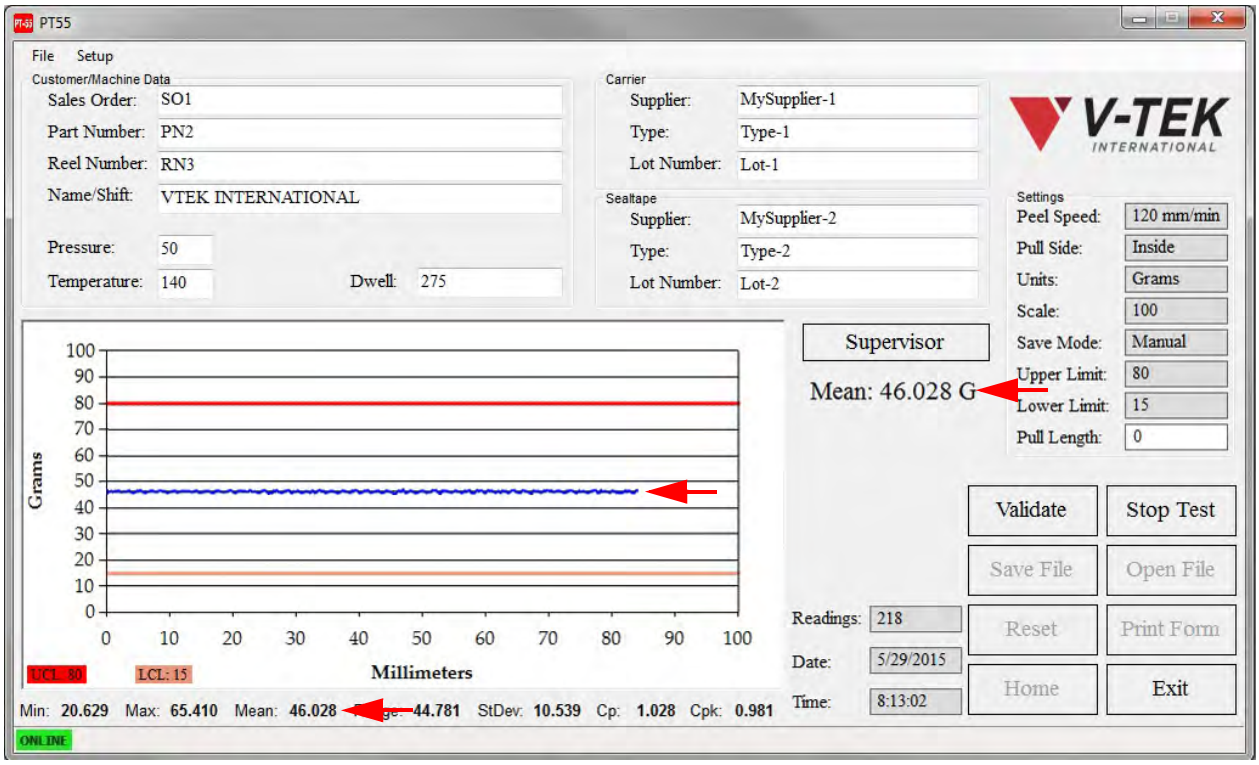


Figure 4.15

7. Let the chart record at least 50mm of travel then press **Stop Test**.

8. The **Mean** value is displayed under the graph. It should be (+/-) 3g from the nominal value of the weight used..

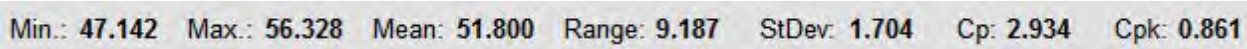
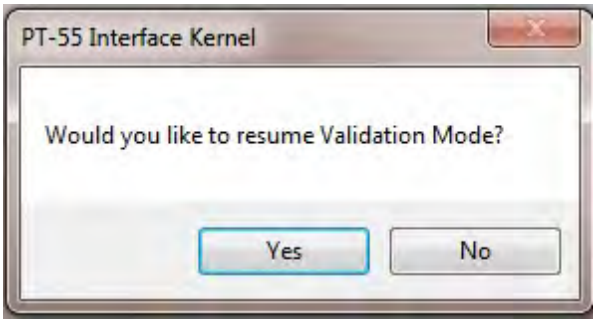


Figure 4.16

9. If the mean value is out of spec, conduct *Calibration* and *Validation* again.

Once validation is complete the dialog screen on the right will appear. Select **No** to exit *Validation Mode*.



Upgrade Laptop to Windows 10 Pro

The PT-55 HMI will work on a PC running Windows 7 Pro or Windows 10 Pro. This procedure is only required if a laptop is being upgraded to Windows 10 Pro.

Caution: Upgrading an existing laptop to Microsoft Windows 10 Professional, will remove all history files. Ensure all files are backed up in a separate storage unit prior to upgrading to Windows 10.

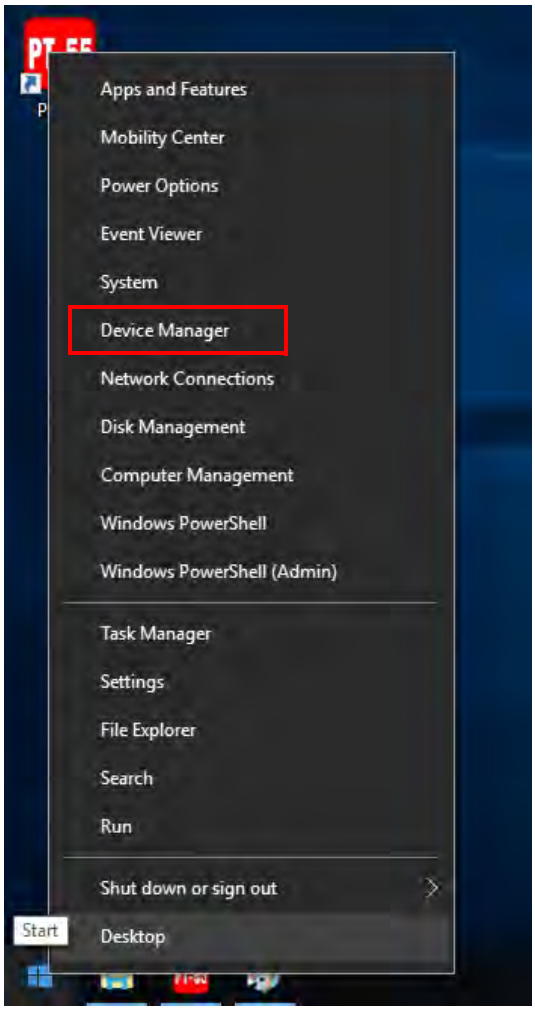
1. Ensure the laptop is connected to the internet. Follow manufacturer's instructions for loading and updating Windows 10 Pro on the laptop.

2. Connect the PT-55 to laptop.

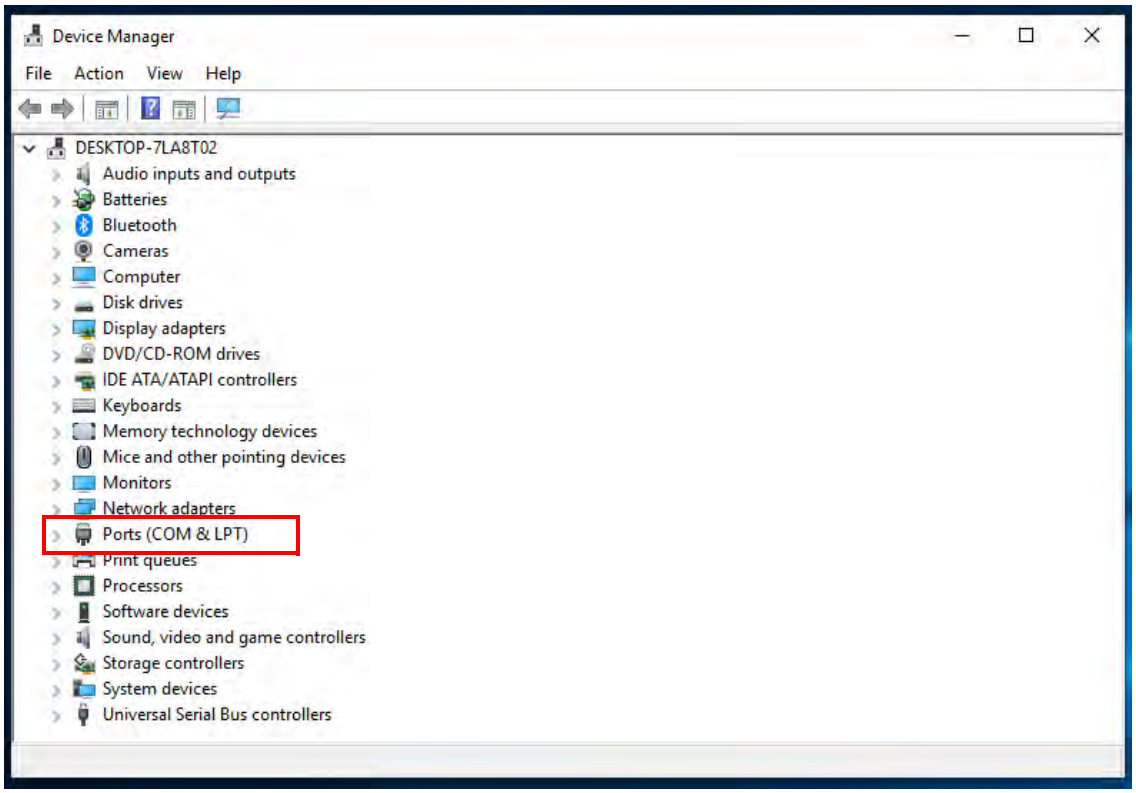
3. Install the new PT-55 software using the USB flash drive provided by V-TEK Service.

4. Right click the **Windows Start Menu** icon which is located in the bottom left corner of the screen.

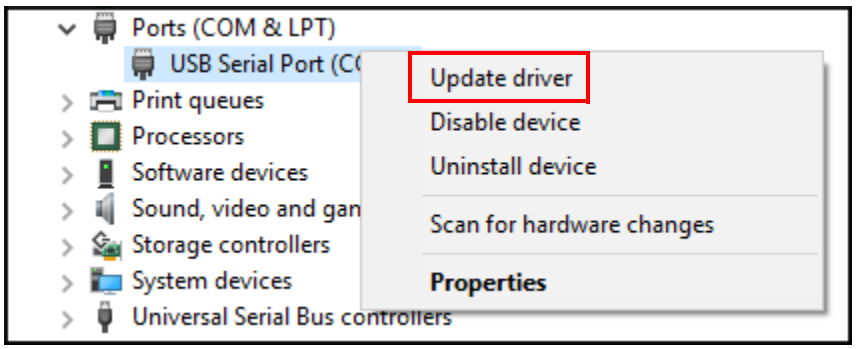
5. Right click on the Device Manager.



6. In Device Manager, double click **Ports (COM & LPT)**

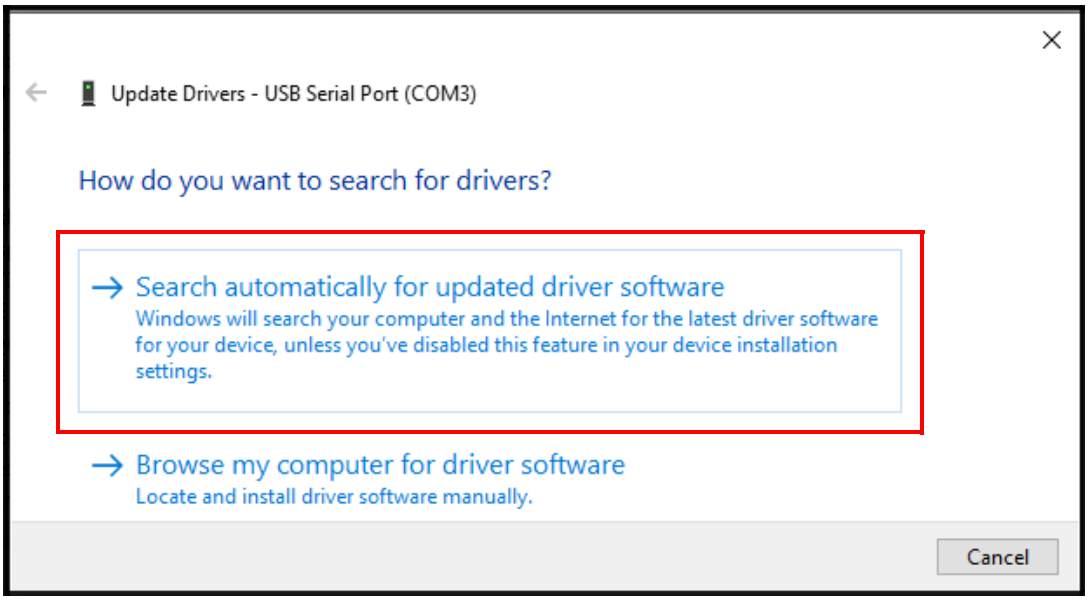


7. Right click on the driver for the PT-55 to open the right-click menu. Click **Update Driver**.



Note: The driver is typically identified as the COM port the PT-55 is plugged into.

8. Click **Search Automatically For Updated Driver Software**.



Note: This search requires internet connection.

9. When prompted, install updated driver software.

Note: Firewalls and anti-virus software may interfere with a simple installation

10. Calibrate the PT-55 and verify calibration as described earlier in this chapter.

11. An internet connection is no longer required. Disconnect if so desired.

Appendix A
Changing the Computer BIOS Setting

Appendix A: Changing the Computer BIOS Setting

Some computers may need to have their BIOS reconfigured to ensure they will not startup from the USB ports. If your computer is not booting up correctly at startup, remove any USB connections and attempt to start the system again. If it boots correctly without any USB connections, then follow the instructions below to change the BIOS settings.

Note: The instructions below show startup menus and screens from a Lenovo computer running BIOS version 1.46 (6JET88WW). Screens and instructions may vary slightly when working with other computers, although the required boot priority order will remain the same.

1. Power the computer on.

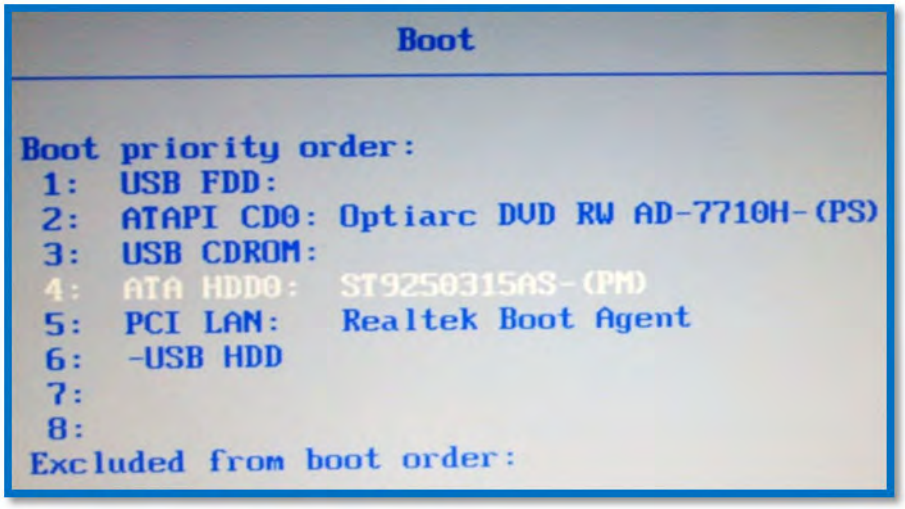
2. When the image below appears, press **F1** to enter the *BIOS Setup Utility*.

Note: The message on the startup screen prompts the user to press **Enter** to interrupt the startup process, however that is a less direct route to the *Startup Menu*. Pressing **F1** during startup takes you directly to the *Startup Menu*.

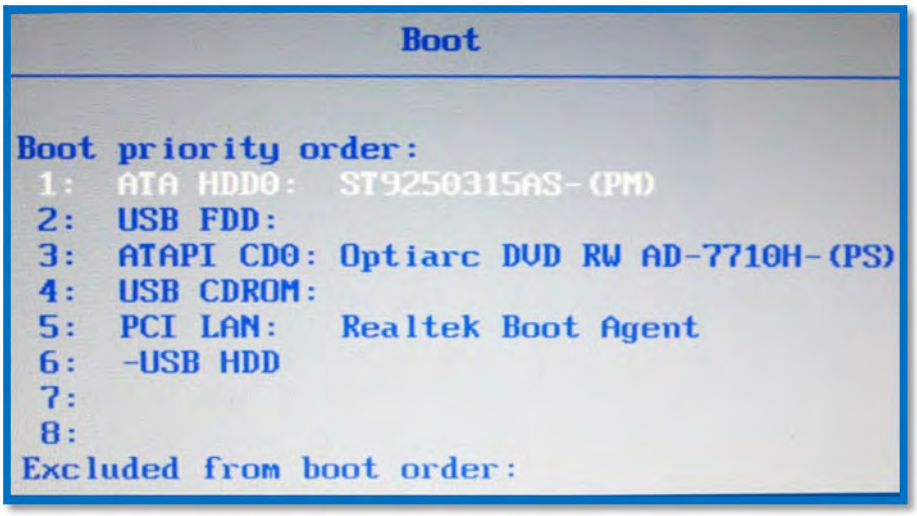
3. Use the **Up / Down** arrow keys to hightlight **Startup**. Press **Enter** to open the *Startup Menu*.

4. Use the **Up / Down** arrow keys to hightlight **Boot**. Press **Enter** to open the *Boot Options Menu*.

5. Use the **Up / Down** arrow keys to highlight **ATA HDD0.**

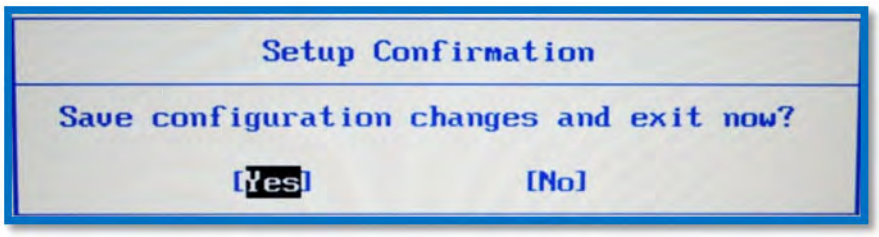


6. Press **F6** three times to move **ATA HDD0** to the top position on the list as shown below.



7. Press **F10** to save this setting and exit *Boot Options*.

8. The Setup Confirmation dialog will open. With **Yes** highlighted press the **Enter** key.



The computer is now ready for operation.

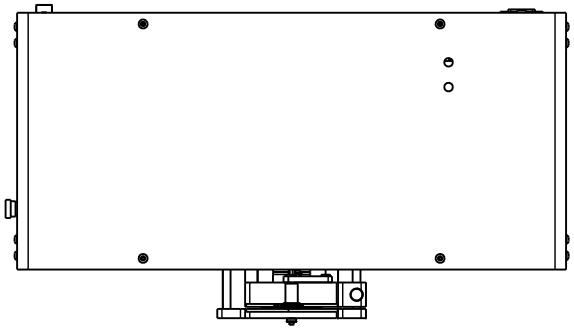
PT-55

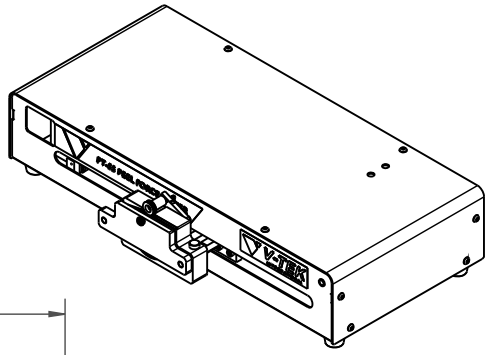
Index

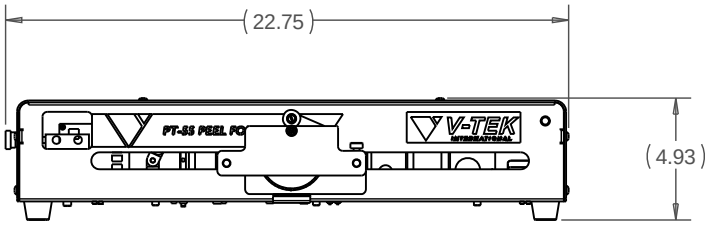
Spare Parts List
PT-55

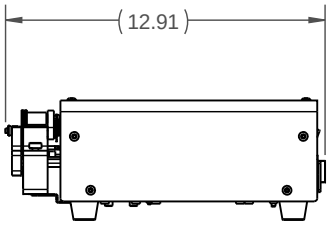
Part Number	Description	Quantity
	Base Machine	
102522	Travel limit switch	2
102596	Rocker switch	1
103549	Power supply, 24V 2.1A triad	1
105785	Memory flash drive, 1GB	1
107015	Alligator clip	1
111175	Front decal	1
150053	PT-55 control board	1
157004	Motor stepper	1
157005	Motor stepper driver	1
157008	Panel light	1
157012	USB cable, 3FT, male A to MA	1
204012	Drive bearing	2
204054	Bearing	2
204056	Bearing, 1/8Dx3/8OD flanged	2
209011	Spring	1
210055	Timing belt	1
212011	O-Rings	2
217211	Feet, poly	4
250052	Idler wheel	1
250077	Idler Arm	1
258974	Drive sprocket	1
262795	Adjustment knob,.500”	1
291249	Load Cell Assembly (Replacement)	1
	Accessories	
105078	Mass set with calibration	1
291483	Netbook with security bracket	1

REVISI				
ECO #	REV.	DESCRIPTION	DATE	APPROVED
	A	RELEASE	10/1/2013	RH
2744	D	REPLACED SCREW WITH SHOULDER BOLT TO SECURE CALIBRATION BEARING	10/14/2013	RH
2847	E	REPLACED PART NUMBER 103549 WITH PART NUMBER 103590 (POWER SUPPLY)	3/25/2015	RH
2858	F	REMOVE POWER SUPPLY (103590) AND REPLACE WITH POWER SUPPLY (103549)	5/20/2015	RH
2936	G	REPLACE 111167 WITH 111174 AND 111175	5/11/2017	PVO
3022	H	REPLACE STEPPER DRIVER 157005 WITH 105929	2/26/2018	PVO
3103	I	REMOVED SHIM (PART NUMBER 207022)	12/20/2018	PVO









UNLESS OTHERWISE SPECIFIED:

DIMENSIONS ARE IN INCHES
TOLERANCES: .XXX ± 0.005
.XX ± 0.010
.X ± 0.015
ANGULAR: MACHINED ± 0.1°
BEND ± 0.5 °
SURFACE: 32

GENERAL NOTES:
- INTERPRET GEOMETRIC TOLERANCING PER ANSI Y14.5
- BREAK ALL SHARP EDGES .010 MAX UNLESS NOTED
- CHAMFER ALL HOLES .015 X .015 ±.010 UNLESS NOTED
- ALL MATERIALS, COATINGS, & CLEANING PROCESSES MUST RESULT IN RoHS COMPLIANT PART
- DO NOT SCALE DRAWING

	NAME	DATE
DRAWN	RH	9/30/13
ENG APPR.		~

V-TEK INCORPORATED

TITLE:

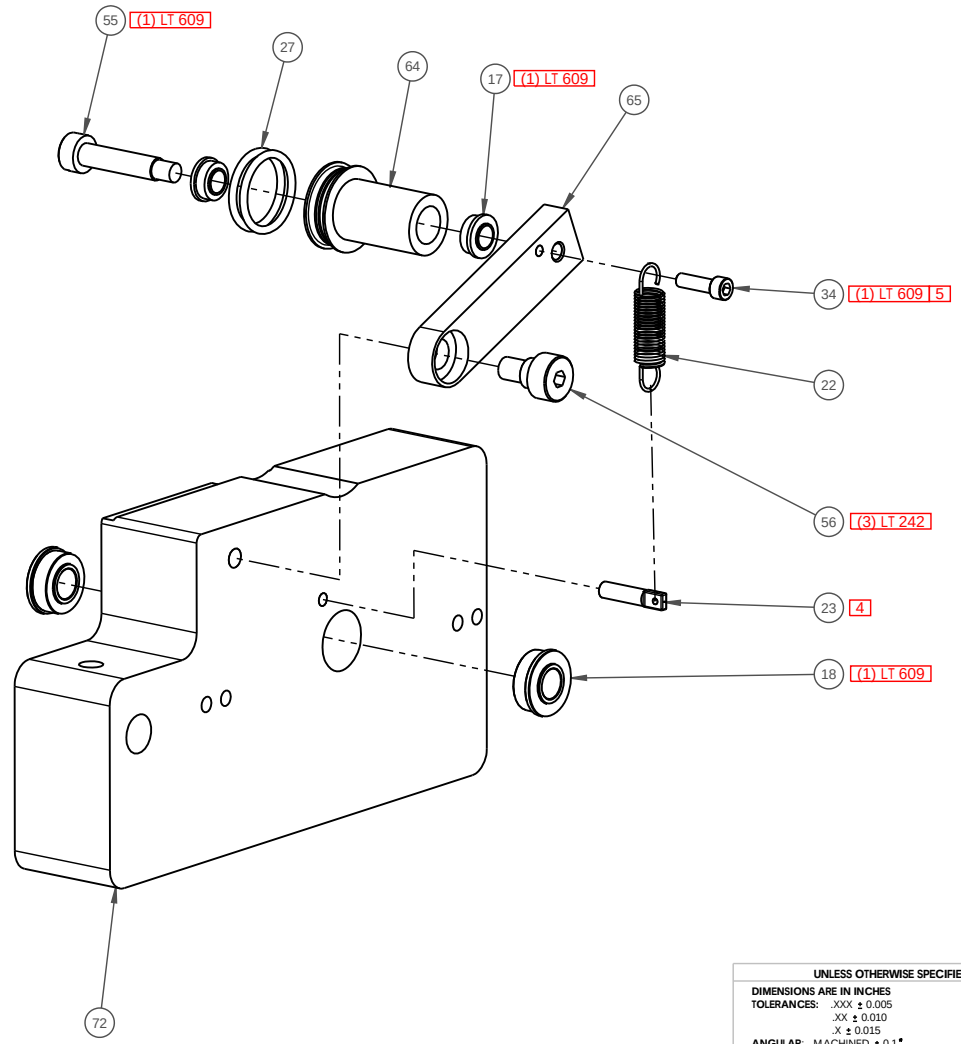
MATERIAL

FINISH

SIZE B | DWG. NO. 291294 | REV I

WEIGHT (lbs): 11.66

SHEET 1 OF 9



ITEM NO.	PART NUMBER	DESCRIPTION	QTY
17	204054	BEARING	2
18	204055	BEARING SFR-188ZZEE	3
22	209011	SPRING, STAINLESS STEEL	1
23	209101	SPRING ANCHOR	1
27	212011	ORING 015 NEOPRENE	2
34	221002	SHCS SS 4-40 X 3/8	3
55	234004	SHOULDER SCREW 3/16 X 3/4 SS	1
56	234010	SHOULDER SCREW SS 1/4 X 1/8	1
64	250052	IDLER WHEEL	1
65	250077	PC-25 IDLER ARM	1
72	265716	REAR GUIDE TRACK	1

UNLESS OTHERWISE SPECIFIED:

DIMENSIONS ARE IN INCHES
TOLERANCES: .XXX ± 0.005
.XX ± 0.010
.X ± 0.015
ANGULAR: MACHINED ± 0.1°
BEND ± 0.5 °
SURFACE: 63

GENERAL NOTES:
- INTERPRET GEOMETRIC TOLERANCING PER ANSI Y14.5
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- DO NOT SCALE DRAWING

	NAME	DATE
DRAWN	RH	9/30/13
ENG APPR.		~

V-TEK INCORPORATED

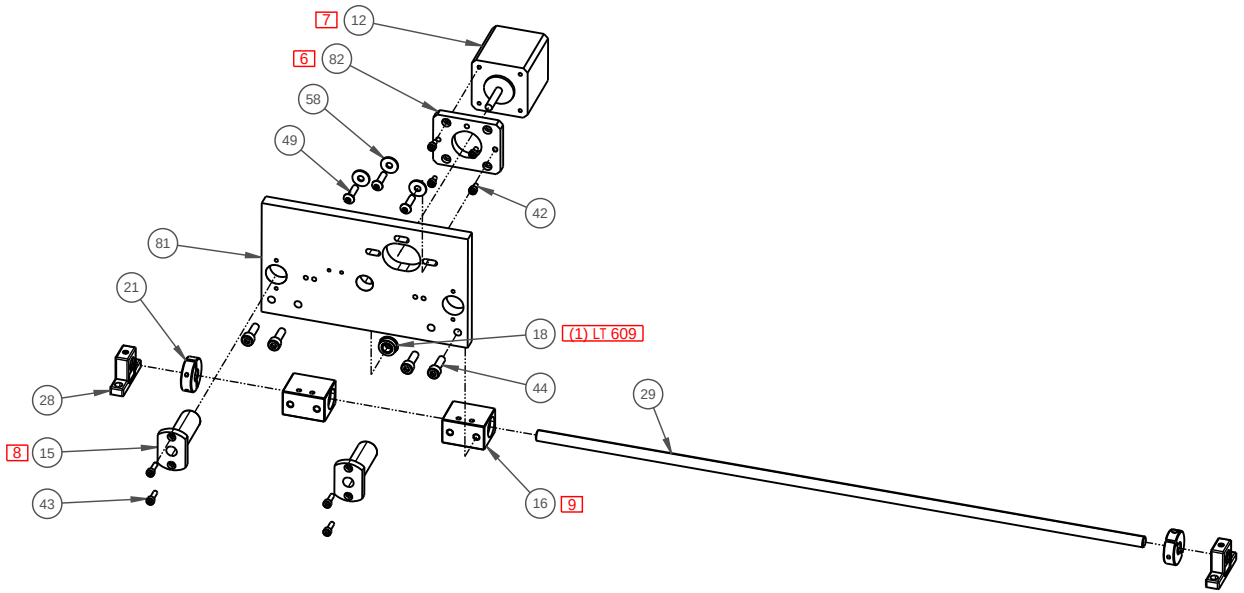
TITLE:

MATERIAL

FINISH

SIZE B | DWG. NO. 291294 | REV I

WEIGHT (lbs): 11.66



ITEM NO.	PART NUMBER	DESCRIPTION	QTY
12	157004	STP-MTR-17048	1
15	204011	WIDTH ADJUST BEARING	2
16	204012	DRIVE BEARING	2
18	204055	BEARING SFR-188ZZEE	3
21	206057	SCSPP8	2
28	216024	SHAFT SUPPORT	2
29	216030	DRIVE GUIDE SHAFT	1
42	221710	SHCS SS M3 X 6	4
43	221712	SHCS SS M3 X 10	4
44	221745	SHCS SS M5 X 16	4
49	223038	BHCS SS #8-32 X .625	3
58	238008	#8 SS FLAT WASHER	3
81	265889	PT55 MOTOR MOUNT	1
82	266094	MOTOR ISOLATOR	1

UNLESS OTHERWISE SPECIFIED:

DIMENSIONS ARE IN INCHES
TOLERANCES: .XXX ± 0.005
.XX ± 0.010
.X ± 0.015
ANGULAR: MACHINED ± 0.1°
BEND ± 0.5 °
SURFACE: 63

GENERAL NOTES:
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	NAME	DATE
DRAWN	RH	9/30/13
ENG APPR.		~

V-TEK INCORPORATED

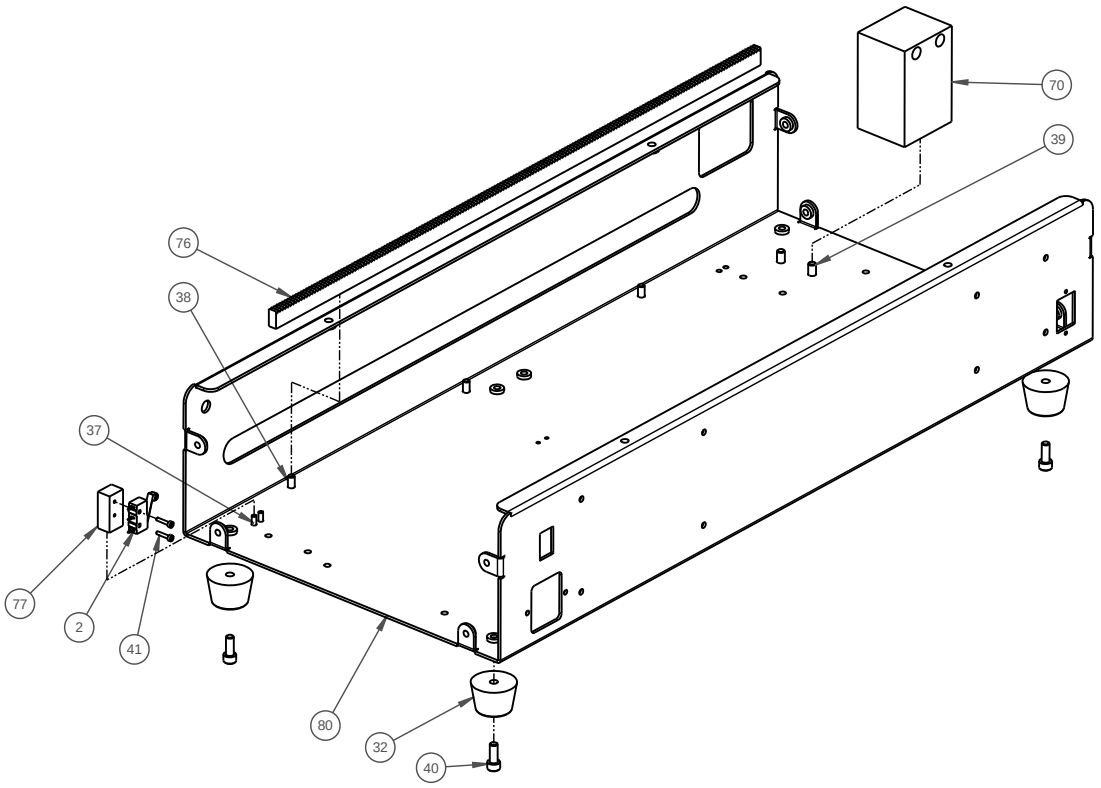
TITLE:

MATERIAL

FINISH

SIZE B | DWG. NO. 291294 | REV I

WEIGHT (lbs): 11.66



NOTE:
RIGHT HAND SIDE ***SWITCH ASSEMBLY***
TO BE PLACED WHEN ELECTRICAL
COMPONENTS ARE PLACED.

ITEM NO.	PART NUMBER	DESCRIPTION	QTY
2	102522	SWITCH MICRO LIMIT	2
32	217211	FEET POLY	4
36	221007	SHCS SS 4-40 X 1-1/4	4
38	221026	SHCS SS 8-32 X 3/8	3
39	221048	SHCS SS 10-32 X 3/8	6
40	221050	SHCS SS 10-32 X 1/2	4
41	221703	SHCS SS M2 X 10	4
70	265714	SLIDER BLOCK	1
76	265728	GEAR RACK MOD (PIC DESIGN AG-11)	1
77	265729	LIMIT SWITCH MOUNT	2
80	265888	PT55 BOTTOM ENCLOSURE	1

UNLESS OTHERWISE SPECIFIED:

DIMENSIONS ARE IN INCHES
TOLERANCES: .XXX ± 0.005
.XX ± 0.010
.X ± 0.015
ANGULAR: MACHINED ± 0.1°
BEND ± 0.5 °
SURFACE: 63

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- CHAMFER ALL HOLES .015 X .015 ±.010 UNLESS NOTED
- ALL MATERIALS, COATINGS, & CLEANING PROCESSES MUST RESULT IN RoHS COMPLIANT PART
- DO NOT SCALE DRAWING

	NAME	DATE
DRAWN	RH	9/30/13
ENG APPR.		~

V-TEK INCORPORATED

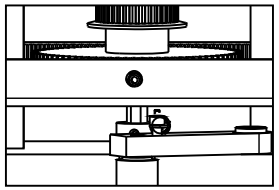
TITLE:

MATERIAL

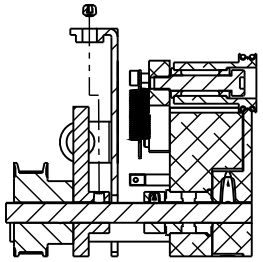
FINISH

SIZE B | DWG. NO. 291294 | REV I

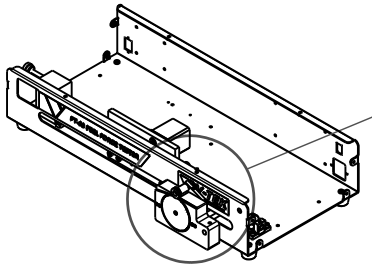
WEIGHT (lbs): 11.66



DETAIL A
TOP VIEW SET SCREW ACCESS
SCALE 1:1.5

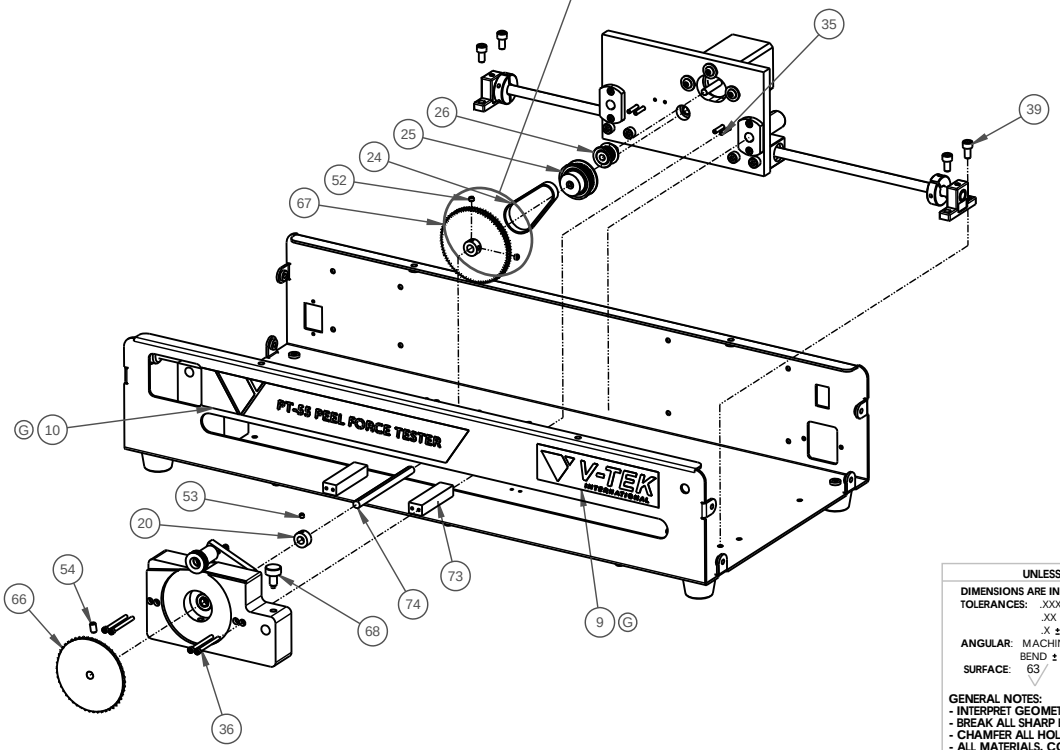


DETAIL B
SECTION VIEW SET SCREW ACCESS
SCALE 1:1.5



DETAIL C
PLACEMENT FOR SCREW ACCESS
SCALE 1:8

NOTE:
MOVE THE ***GUIDE TRACK ASSEMBLY*** TO THE RIGHT OF THE ***ENCLOSURE*** AND USE THE RIGHT BOLT HOLE TO ACCESS THE SET SCREWS IN THE ***SPUR GEAR*** (262111).



ITEM NO.	PART NUMBER	DESCRIPTION	QTY
9	111174	GENERIC V-TEK DECAL	1
10	111175	DECAL, PT55, TOP LINE DECAL	1
20	206002	COLLAR 1/4 X 1/2	1
24	210055	TB7UP4-70-BERG	1
25	211026	GEAR	1
26	211050	ATP20MXL025-B-P5	1
35	221005	SHCS SS 4-40 X .75 LG	4
36	221007	SHCS SS 4-40 X 1-1/4	4
39	221048	SHCS SS 10-32 X 3/8	6
52	230016	8-32 X 1/8 STEEL SET SCREW	2
53	230036	6-40 X 1/8 STEEL SET SCREW	1
54	230071	10-24 X 5/16 STEEL SET SCREW	1
66	258974	DRIVE SPROCKET	1
67	262111	SPUR GEAR MODIFICATION	1
68	262795	ADJUSTMENT KNOB - .500"	1
73	265717	TRACK STAND OFF	2
74	265720	DRIVE SHAFT	1

UNLESS OTHERWISE SPECIFIED:
DIMENSIONS ARE IN INCHES
TOLERANCES: .XXX ± 0.005
.XX ± 0.010
.X ± 0.015
ANGULAR: MACHINED ± 0.1°
BEND ± 0.5 °
SURFACE: 63

GENERAL NOTES:
- INTERPRET GEOMETRIC TOLERANCING PER ANSI Y14.5
- BREAK ALL SHARP EDGES .010 MAX UNLESS NOTED
- CHAMFER ALL HOLES .015 X .015 ±.010 UNLESS NOTED
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	NAME	DATE
DRAWN	RH	9/30/13
ENG APPR.		~

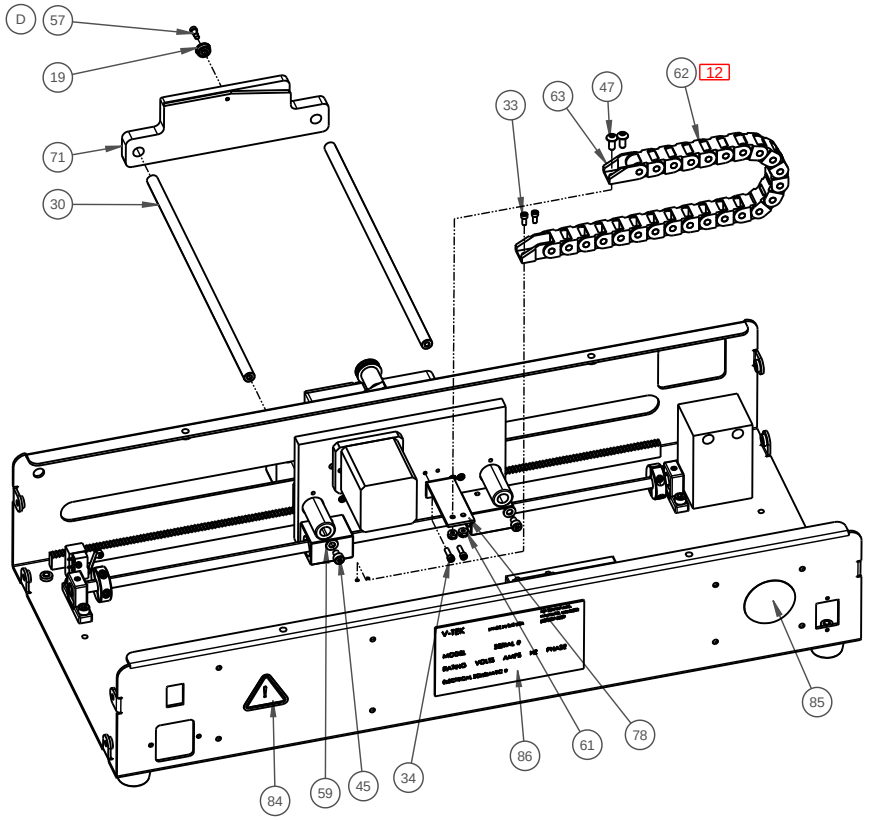
V-TEK INCORPORATED

TITLE:

MATERIAL
FINISH

SIZE B | DWG. NO. 291294 | REV I

WEIGHT (lbs): 11.66 | SHEET 5 OF 9



ITEM NO.	PART NUMBER	DESCRIPTION	QTY
19	204056	BEARING 1/8 ID X 3/8 DIA FLANGED	1
30	216031	TAPE WIDTH ADJUST SHAFT	2
33	221001	SHCS SS 4-40 X 1/4	2
34	221002	SHCS SS 4-40 X 3/8	3
45	221750	SHCS SS M4 X 6	2
47	222002	BHCS STEEL 4-40 X 3/8	2
57	234041	1/8" X 3/16" SHOULDER BOLT	1
59	238043	M4 SS FLAT WASHER	2
61	239051	4-40 NYLOK NUT	2
62	249959	ENERGY CHAIN 24 LINKS	24
63	249960	ENERGY CHAIN MOUNTING BRACKET	1
71	265715	OUTER TRACK GUIDE	1
78	265804	E-CHAIN MOUNT	1
84	111004	SAFETY STICKER EX. POINT	1
85	111005	SAFETY STICKER SETUP MANUAL	1
86	253864	SERIAL NUMBER PLATE - CE	1

UNLESS OTHERWISE SPECIFIED:

DIMENSIONS ARE IN INCHES
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.XX ± 0.010
.X ± 0.015
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BEND ± 0.5 °
SURFACE: 63

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DRAWN	RH	9/30/13
ENG APPR.		~

V-TEK INCORPORATED

TITLE:

MATERIAL

FINISH

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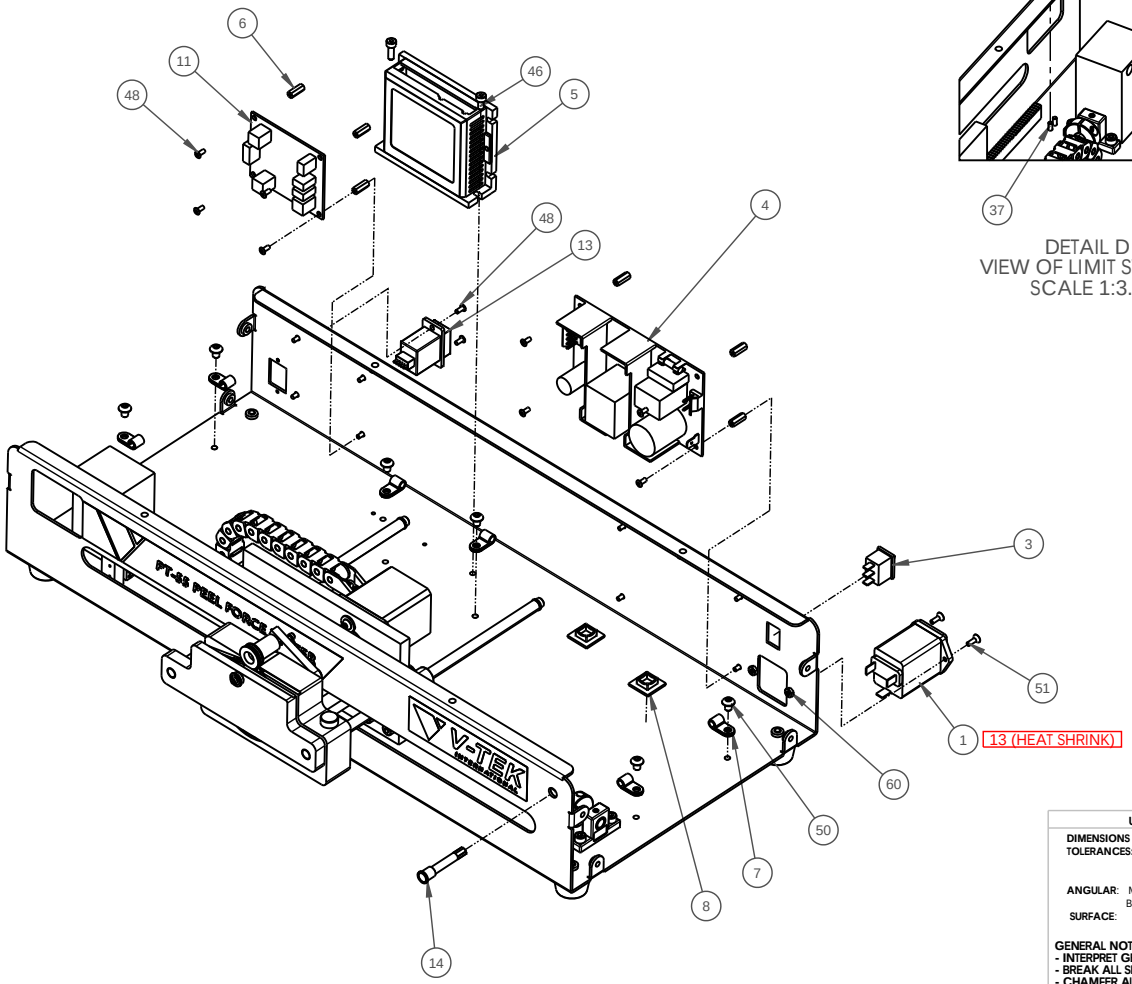

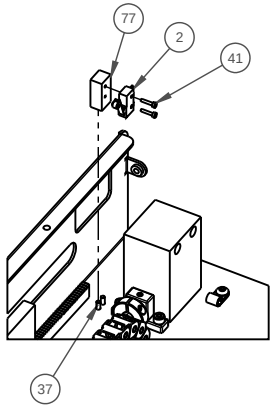

DETAIL D
VIEW OF LIMIT SWITCH
SCALE 1:3.5

ITEM NO.	PART NUMBER	DESCRIPTION	QTY
1	101908	FILTER AC ENTRY FUSED	1
2	102522	SWITCH MICRO LIMIT	2
3	102596	SWITCH ROCKER SPST	1
4	103549	POWER SUPPLY 24V 2.1A TRIAD	1
5	105929	DRIVER ST5-S	1
6	106043	STANDOFF 4-40 1/2"	8
7	107104	CABLE CLAMP 3/16-.203	6
8	108564	TIE HOLDER ADHESIVE	2
11	150053	CONTROL BOARD PT55	1
13	157007	USB PANEL MOUNT	1
14	157008	PANEL LIGHT	1
37	221009	SHCS SS 4-40 X 5/16	4
41	221703	SHCS SS M2 X 10	4
46	221763	SS SHCS M4 x 8mm	2
48	223033	BHCS SS 4-40 X 1/4	18
50	223050	BHCS SS 10-32 X 1/4	18
51	225002	FHCS SS 4-40 X 3/8	2
60	239001	4-40 SS HEX NUT	2
77	265729	LIMIT SWITCH MOUNT	2

UNLESS OTHERWISE SPECIFIED:

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.XX ± 0.010
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	NAME	DATE
DRAWN	RH	9/30/13
ENG APPR.		~

V-TEK INCORPORATED

TITLE:

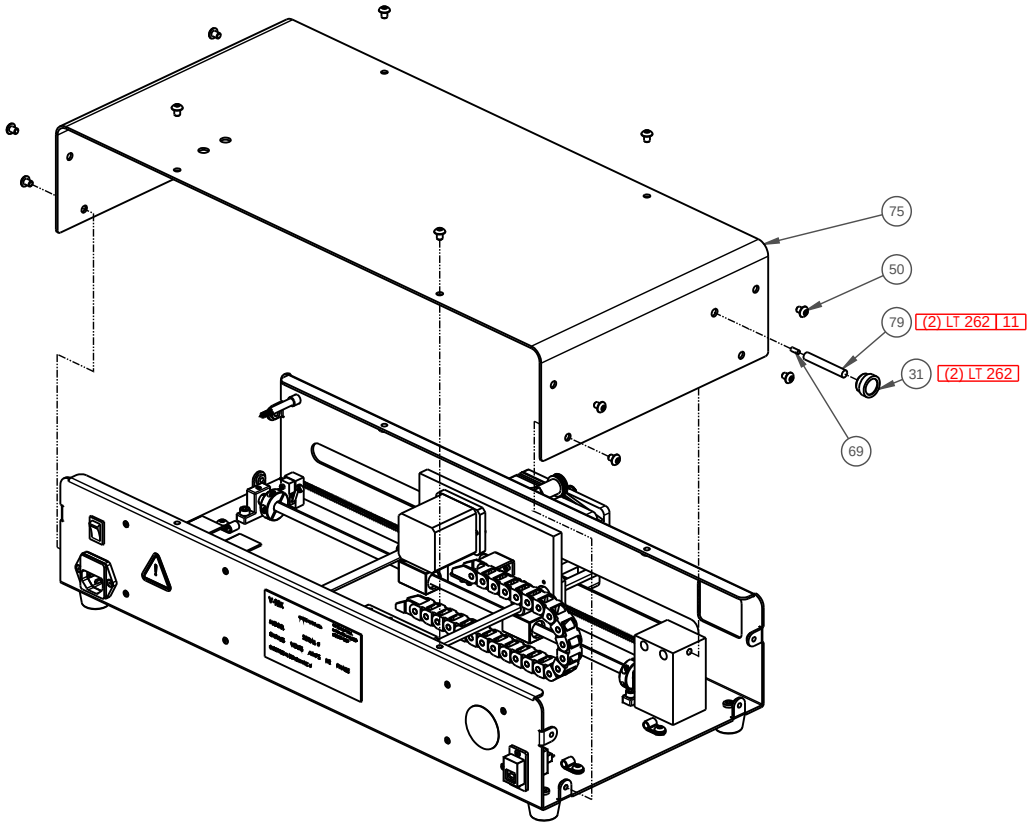
MATERIAL

FINISH

SIZE B | DWG. NO. 291294 | REV I

WEIGHT (lbs): 11.66

SHEET 7 OF 9



NOTE:
DO PLACE ***TOP ENCLOSURE*** (265722)
OR ***LOAD CELL LOCK*** PARTS UNTIL
FINAL ASSEMBLY OF ***PT-55*** (291293).

ITEM NO.	PART NUMBER	DESCRIPTION	QTY
31	217004	KNOB, 1/4-20, FEMALE THREAD	1
50	223050	BHCS SS 10-32 X 1/4	18
69	265040	LOAD CELL LOCK INSERT	1
75	265722	TOP ENCLOSURE	1
79	265806	LOAD CELL LOCK	1

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.XX ± 0.010
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	NAME	DATE
DRAWN	RH	9/30/13
ENG APPR.		~

V-TEK INCORPORATED

TITLE:

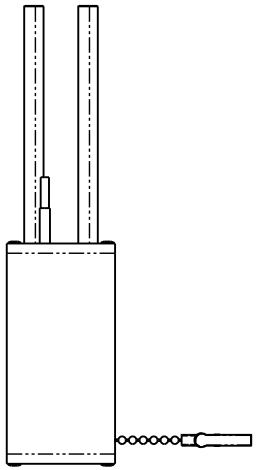
MATERIAL

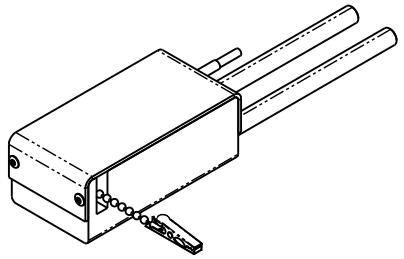
FINISH

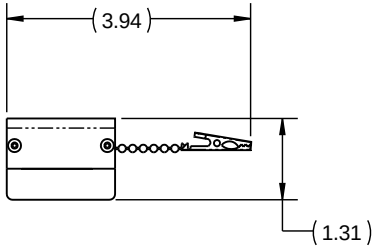
SIZE B | DWG. NO. 291294 | REV I

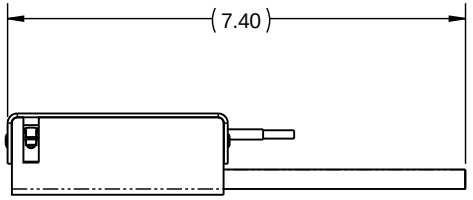
WEIGHT (lbs): 11.66 | SHEET 8 OF 9

REVISIONS				
ECO #	REV.	DESCRIPTION	DATE	APPROVED
	B		10/1/2013	RH
2729	C	REMOVED 217004, 265714, AND 265806	5/13/2013	RH









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	NAME	DATE
DRAWN	RH	10/1/13
ENG APPR.		~

V-TEK INCORPORATED

TITLE:

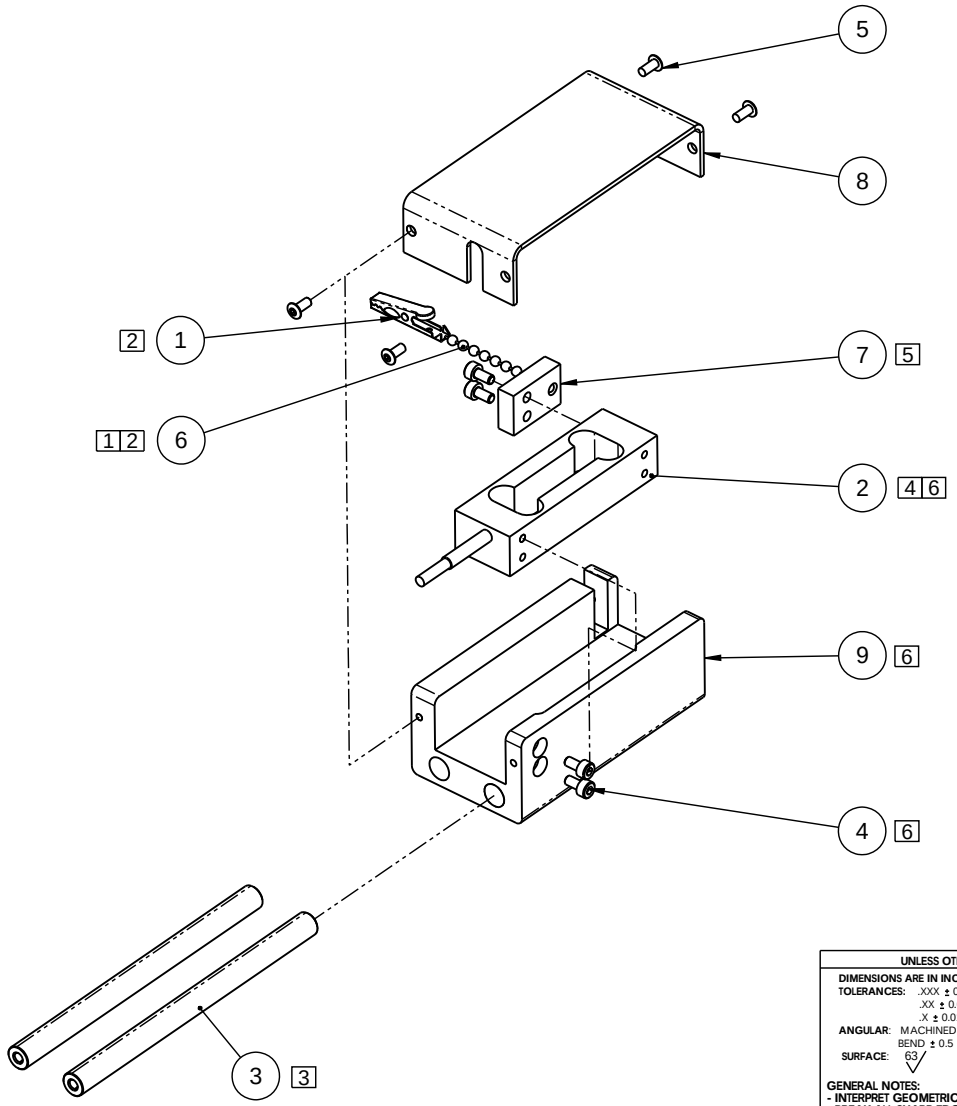
LOAD CELL

MATERIAL

FINISH

SIZE **B** | DWG. NO. 291249 | REV C

WEIGHT (lbs):



NOTE:
DO NOT ATTACH ***LOAD CELL COVER*** (265734) UNTIL ***PT-55*** (291293) FINAL ASSEMBLY

ITEM NO.	PART NUMBER	DESCRIPTION	QTY
1	107015	ALLIGATOR CLIP 1 3/	1
2	157006	LOAD CELL	1
3	216023	LOAD CELL SLIDER SHAFT	2
4	221710	SHCS SS M3 X 6	4
5	223008	BHCS SS 4-40 X 1/4	4
6	265076	LOAD CELL CHAIN	1
7	265733	CHAIN HOLDER	1
8	265734	LOAD CELL COVER	1
9	266895	FIXED LOAD CELL BLOCK	1

UNLESS OTHERWISE SPECIFIED:

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.XX ± 0.010
.X ± 0.015
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	NAME	DATE
DRAWN	RH	10/1/13
ENG APPR.		~

V-TEK INCORPORATED

TITLE:

LOAD CELL

MATERIAL

FINISH

SIZE **B** | DWG. NO. 291249 | REV C

WEIGHT (lbs):

751 Summit Avenue
Mankato, MN USA 56001

Website: www.vtekusa.com
Email: service@vtekusa.com
Phone: (507) 387-2039

For inquiries regarding spare parts, tape and reel supplies, or the service department, please call or write:

Phone: (507) 387-2039

Email: service@vtekusa.com
Please provide the machine model and serial numbers with all inquiries.

NOTES

PT-55

Document List

Section	Description	File Name
Cover Sheet	Page 1 of 1	D291308.1v.fm
EC Declaration of Conformity	Page 1 of 1	PT-55 DOC.doc
Preface	Pages i - iv	D291308.2f.fm
Table of Contents	Page 1-2	D291308.3L.fm
Chapter 1: Machine Overview	Pages 1-6	D291308.4f.fm
Chapter 2: Setup	Pages 7-24	D291308.5r.fm
Chapter 3: Operation	Pages 25-66	D291308.7m.fm
Chapter 4: Maintenance	Pages 67-76	D291308.6s.fm
Appendix A: Changing the BIOS	Page 1 of 2	D291566.1.fm
Index	Page 1 of 2	D291308.8h.fm
Spare Parts List	Page 1 of 1	D291427h.fm
Exploded Views		
Base Exploded View	Pages 1-8	291294.slddrw
Load Cell Exploded View	Pages 1-2	291249.slddrw
Service and Parts Contacts	Page 1 of 1	61053915.fm
	This document	D291308.9ai.fm
Warranty Document	Page 1 of 1	WI201.16, Rev. 5
Back Sheet	Page 1 of 1	D291308.10b.fm

EXPRESS WARRANTY, EXCLUSION AND DISCLAIMER OF UNSTATED WARRANTIES AND LIMITATION OF LIABILITY

V-TEK Inc (V-TEK) manufactures equipment for the Royce Instruments and V-TEK International brands. The following warranty applies to both product lines.

1. V-TEK warrants for one year from date of receipt by end user that equipment manufactured by V-TEK will be free of defects in workmanship and materials.
2. All integrated products purchased by V-TEK and integrated on to V-TEK equipment shall be covered in accordance with the manufacturer's pass through warranty and limited in costs equal to the amount of the manufacturer's pass through warranty.
3. V-TEK's obligation under this warranty applies only to the original Customer and commences when V-TEK is notified of name, address of Customer, and date of receipt of equipment.
4. During the warranty period, V-TEK will replace any defective non-consumable parts returned for that purpose to the designated V-TEK Replacement Parts Center or at V-TEK's option, refund original cost of equipment.
5. Authorization to return Articles purchased from V-TEK must be obtained by Customer before return shipping commences.
6. Credit may be granted, less an appropriate restocking charge of 15 to 20% of invoice amount, depending on the reason for the return and condition of the Articles.
7. Returns should always be carefully packed in original shipping carton and sent via ground service. V-TEK does not assume any liability for damage incurred during shipment.
8. For the first 30 days that you own your V-TEK product, V-TEK will be responsible for ground shipments to and from V-TEK's facility in Mankato, MN, U.S.A. or its designate. For the remainder of your warranty V-TEK will pay freight for returning your product to you after its repair.
9. Customer shall bear all charges for customs duty fees or freight above the ground rate or for articles returned which are not defective.
10. Collect shipments will not be accepted.
11. Insurance coverage during shipping is the responsibility of the Customer. V-TEK does not assume any liability for damage incurred during shipment.
12. The warranty applies only to normal use of the equipment and shall be void if V-TEK determines that defects in or failures of the equipment were caused by the Customer's negligence including the lack of proper preventative maintenance, misuse or accident or by unauthorized repair, alteration or installation.
13. This Warranty does not extend to consumable items or mechanical parts subject to normal wear.
14. Customer's exclusive remedy for claims against V-TEK shall be the repair or replacement of defective equipment and parts.
15. Any modification to the standard configuration of this equipment as delivered will void the warranty, unless V-TEK personnel make the modification.

THIS WARRANTY IS EXPRESSLY MADE IN LIEU OF ANY AND ALL OTHER WARRANTIES, EXPRESSED OR IMPLIED, INCLUDING THE WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE. IN NO EVENT WILL V-TEK BE LIABLE FOR INCIDENTAL, SPECIAL OR CONSEQUENTIAL PENALTIES OR DAMAGES, INCLUDING LOST PROFITS OR PENALTIES AND/OR DAMAGES FOR DELAY IN DELIVERY OR FAILURE TO GIVE NOTICE OF DELAY EVEN IF V-TEK HAS BEEN ADVISED OF THE POSSIBILITY OF SUCH DAMAGES.

PASS THROUGH WARRANTIES ARE AVAILABLE FROM THE RESPECTIVE MANUFACTURERS**.**

SERIAL NUMBER:

MODEL:

DATE OF MANUFACTURE:

751 Summit Avenue
Mankato, MN 56001

(507) 387-2039 FAX: (507) 387-2257

www.vtekusa.com
Email: info@vtekusa.com