



Test Mark Industries, Inc.

995 N. Market St.

East Palestine, OH 44413-1109

Tel: (330) 426-2200 Fax: (330) 426-2210

Email: sales@testmark.net

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FOREWARD

This section of the manual is designed to provide instructions on the set up of the i720 digital indicator. Please take a few moments to read through it and become familiar with the operation. If you require technical support, please call us.

1.0 INTRODUCTION

Standard information displayed on the indicator during a test is peak load, rate of load and Sample ID number, if entered. Information displayed after a test is peak load and average rate of load for the last 50% of the test.

1.1 TEST REPORTS

Test reports can be optionally stored to memory, printed on an optional printer or downloaded to a computer with the optional Able Cable RS-232/USB cable. Details for all options can be found in the following pages.

THE DIGITAL SYSTEM

2.0 THE KEYS AND THEIR FUNCTIONS

THE HARD KEYS

2.1 TARE KEY

Required at the start of each test.

Function: Clears and stores all displayed test values, sets indicator to start a new test.

To use: Press <TARE KEY>, wait until the words “TARE SUCCESSFUL” are displayed before beginning the test. See section 3.0 on how to perform a test and save test results.

2.2 UNITS KEY

Function: Switches indicator between engineering force units of lb., kg, N and kN.

To use: Press <UNITS KEY> to toggle between force options. When required unit type is displayed, function is set.

Note: If the digital indicator is turned OFF, Engineering Units defaults to pounds and must be reset.

Note: Rate of load function is fixed in selected force units per second.

2.3 PRINT KEY

Function: The Print Key is a multiple function key used for transferring/printing stored test data, and entering numerical values to memory.

2.3.1 Test data transfer/print functions with required optional cables installed in the Indicator and connected to receiving unit.

To use: Press <PRINT KEY>, the transfer/print function is automatic. When function is complete you will be prompted to either SAVE or CLEAR stored test data. To save stored test data in memory press <SAVE F1> soft key. To clear test data from memory, press <CLEAR F4> soft key.

Note: Before clearing stored test data from memory transfer or print stored data as cleared data is NOT retrievable.

2.3.2 Entering and Storing a numerical value into a data entry field.

To use: Open function <SAMPLE ID>. Use key pad to input required ID number. When set press <PRINT KEY> to store in memory.

Also used in calibration program to set a numerical value into a field, and select and accept a menu option.

2.4 NUMBER KEY

Function: The <NUMBER KEYS> are used to input a numerical value into a data entry field.

To use: Press <NUMBER> key to set required value.

2.5 MENU KEY

Function: Opens and displays a list of four (4) menu options. They are Audit Trail, Configuration, (Calibration Program), Test Operation and Contrast (brightness) Adjustment. The Contrast Adjustment setting program is the only menu option for user adjustment. DO NOT attempt to enter any of the other displayed menu programs.

2.5.1 Audit Trail & Test Operation – **DO NOT ENTER**. Entering the program will effect the operation of the digital indicator.

2.5.2 Configuration (Calibration Menu) – **DO NOT ENTER**. Entering the program will **ERASE** the calibration settings stored in memory, and they can not be restored. This menu is password protected. If you inadvertently enter it you will be prompted to enter a password. Press <1> key and press <PRINT ENTER> key, and the indicator will return to its normal test operation screen.

2.5.3 Contrast - To use: Press <MENU KEY>, then press <DOWN ARROW ▼ G/N KEY> until menu item Contrast Adjustment is highlighted and reads “Less ← Contrast xx% → More”. To adjust the brightness setting, press <UNITS > ARROW KEY> to brighten contrast. Press the <TARE < ARROW KEY> to darken contrast. When required adjustment is set press Soft Key <F3 SAVE & EXIT MENU>.

2.6 UP ▲ ARROW/ZERO KEY

Function: Used to scroll back one menu line at a time to a previously displayed menu. Normally used in calibration procedure. This key is NOT to be used to zero the indicator.

To use: Press <UP ▲ ARROW/ZERO KEY> to return to a previously displayed menu. This key is NOT to be used to zero the indicator.

2.7 DOWN ▼ ARROW/G-N KEY

Function: Used to scroll forward on menu line at a time. This key is normally used when adjusting the display screen contrast and calibration procedure. This key is NOT to be used to set a Gross/Net tare function.

To use: Press <DOWN ▼ ARROW/G-N KEY> to scroll forward one menu line at a time until menu option is displayed. This key is NOT to be used to set a Gross/Net tare function.

THE SOFT KEYS

2.8 AUTO-STORE (F3) KEY

Function: Turns indicators memory function ON or OFF. When activated, automatically stores test results to memory at the end of a test. Auto-Store must be activated to use the Sample ID function.

To use: Press <AUTO-STORE (F3) KEY>. To turn function ON, press the <F4> key. To turn function OFF, press the <F1> key.

2.9 SAMPLE ID (F1) KEY

Function: Opens the indicators memory function and allows an individual sample ID number to be set and stored to memory automatically at the end of a test.

Note: Auto-Store must be activated for the ID function to operate.

To use: Press <SAMPLE ID (F1) KEY>. Use <NUMBER KEYS> to select and display ID numbers. Up to 25 digits can be set. If an incorrect number is set, press <BACK SPACE F3 KEY> to go back and cancel one number at a time. Continue to select ID number. When the correct ID number is displayed, press <PRINT/ENTER KEY> to set.

Pressing the <CANCEL F1 KEY> when setting an ID number clears all set numbers and displays the words “Entry Mode Cancelled”. Press <SAMPLE ID (F1) KEY> and follow procedure to enter and set ID number.

2.10 TEST RESET

Function: Allows a test in progress to be stopped and cancels sample ID number. Test data will not be stored in memory and display returns to idle mode.

To use: Stop the test by placing the control valve in its hold position. Press <TEST RESET F2 KEY> and test data is cleared. Shift the control valve to retract position and enter new test data.

3.0 TEST SETUP

This section describes how to setup the indicator to conduct a test.

Step 1: If the indicator is factory installed on a Test Mark compression testing machine it should be ON when the machine is connected to an electrical power source. If display is dark, plug indicator power supply cord into outlet box located behind indicator on its frame mounting bracket.

The indicators electrical voltage requirements are listed on its serial number tag on the back of the indicator. If the indicator is being used as a retrofit installation, plug power supply cord into a wall outlet with electrical power supply source compatible with indicator. The indicators supply cord serves as the power disconnect. The power outlet supplying the indicator must be installed near the indicator and be easily accessible.

Allow the indicator to warm up for 15 – 20 minutes before beginning a test or calibrating it.

Note: The indicator has NO ON/OFF switch. Normal procedure is to allow indicator to remain ON 24 hours a day.

Step 2: Verify that the correct Engineering Unit of weight measurement is selected. The current unit is displayed on the screen. Press <UNITS> key to toggle through options of lb, kg, N or kN.

Step 3: Auto-Store – If hard copy test documentation is required, turn Auto-Store function ON. Test results will be stored in memory automatically at the end of each test. See section 2.8.

Step 4: Clear stored test results IF your test documentation program requires clearing stored results from memory before storing new test data. Note: If stored test results are IMPORTANT, print or transfer before clearing as cleared data is non-retrievable. See section 2.3 Print Key function for instructions.

Step 5: Set hydraulic loading control valve in its Retract position and switch hydraulic pump motor on. Insert and center test sample in testing machine.

Step 6: Enter Sample ID number if required, press Sample ID soft key and enter ID number code, and press <PRINT> key to set.

Step 7: To start test, use the hydraulic load control valve to advance the machines piston to the required starting position, normally a point when an air gap of 1/16” (1.5 mm) or less is between the top of the test sample and the bottom of the upper test platen. Place control valve in Hold position. Press indicators <TARE KEY> to remove all residual load values on indicators display screen. The Load and Rate of Load value lines will display “00” indicating it is ready to start. The indicator will also display the words “Tare Successful” and if used, the sample ID number will move to the right hand side of the display screen.

Step 8: Many ASTM test procedures permit a higher rate of loading or a preload to be applied to a test sample at the beginning of a test. Review the applicable ASTM standard for the required Rate of Loading for the sample type and size you are testing.

Shift control valve lever to Full Advance position. At sample contact, the top load line of the screen will show a rapid increase in the load being applied to the test sample. When required preload value is reached, shift control valve lever to Metered Advance position.

The second line of the display is now showing the current live Rate of Loading being applied to the test sample. To adjust and set the required loading rate, slowly turn the knob on the control valve clockwise to decrease loading rate and counter clockwise to increase loading rate. All changes in loading rate are updated live on the display screen.

Once the required rate of loading has been established continue to monitor the display screen making any necessary adjustments to the loading rate as needed.

Note: Because of the compressive nature of the materials used in unbonded pad caps, it may be difficult to set and maintain a controlled rate of loading with an applied load value of less than 20,000 lbs. (88 kN) when testing concrete cylinders.

Step 9: End of test – as the test samples ultimate load is being approached the rate of loading value will begin to decrease due to cracking in the test sample. Make no adjustments in the loading rate when this occurs.

As the test sample yields the displayed live Load will freeze and no longer increase in value. When the indicator detects that the load has fallen below the set sample break percentage, the screen will change and display the words “PEAK LOAD”, indicating that the test sample has reached its maximum load value. Shift the control valve lever to the Retract position. The rate of load line will also change and display the words “Avg Rate of Load” and the corresponding value applied to the sample during the test. If the auto-store function is activated, the sample ID number will go blank indicating that all test data has been stored to memory.

If manually documenting test results, record information before starting a new test. When the Tare key is pressed, displayed test results will be LOST.

A LOAD CELL EQUAL TO OR GREATER THAN THE CAPACITY OF THE MACHINE IS REQUIRED FOR CALIBRATION. CALIBRATION SHOULD BE PERFORMED BY A CERTIFIED CALIBRATION COMPANY.

4.0 CALIBRATION

Step 1: Allow digital to warm up for at least 20 minutes.

Step 2: Before attempting to calibrate the machine, please verify the accuracy. All new machines are shipped from the factory with a calibration stored in the digital indicator.

Step 3: Press the “MENU” button on face of digital.

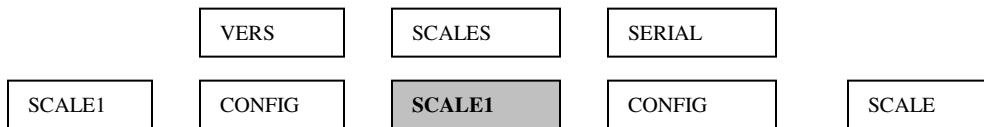
Step 4: Use the down button and select “Configuration” and push print. Then enter the password and press print.

Step 5: This displays the “SCALE CONFIGURATION” menu. “SCALES” will be highlighted.



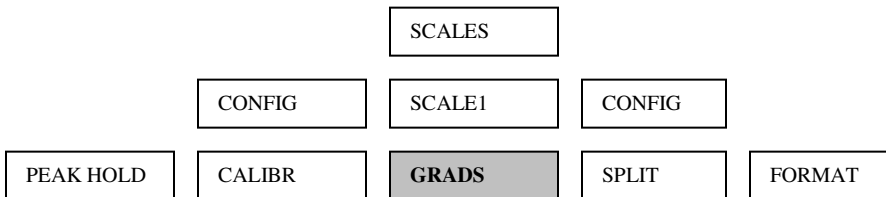
SCALE CONFIGURATION

Step 6: Press the down arrow key once. This displays the “SCALE1 CONFIGURATION” menu. “SCALE1” will be highlighted.



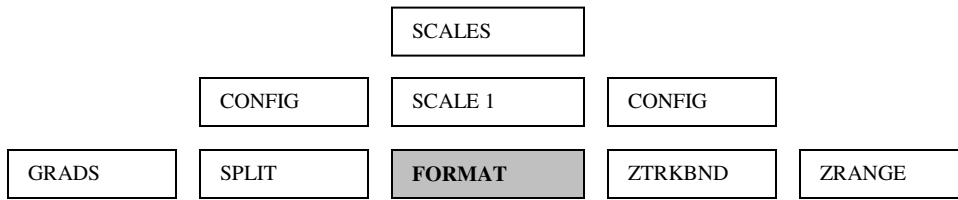
SCALE1 CONFIGURATION

Step 7: Press the down arrow key once. This displays the “FULL SCALE GRADUATIONS” menu. “GRADS” will be highlighted.



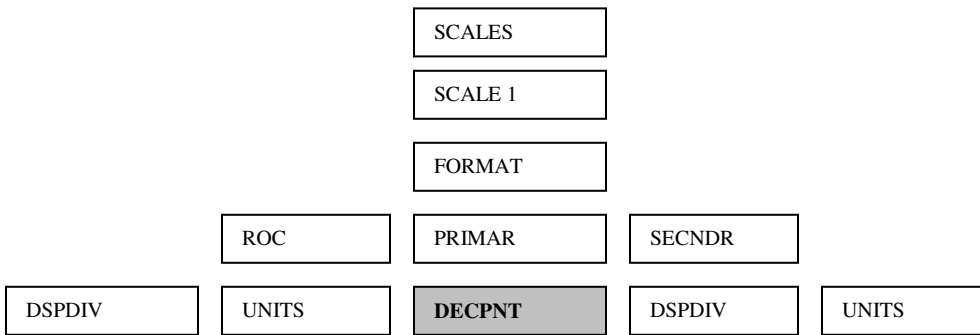
FULL SCALE GRADUATIONS

Step 8: Press the right arrow key 2 times until “FORMAT” is highlighted.



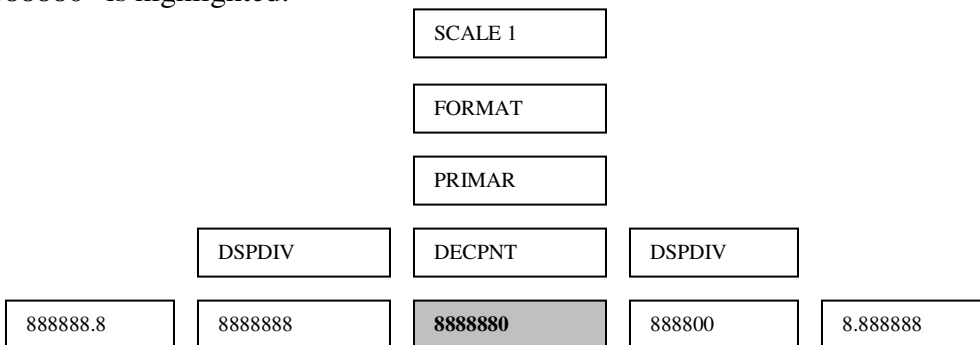
WEIGHT FORMATTING

Step 9: Press the down arrow key 2 times until “DECPNT” is highlighted.



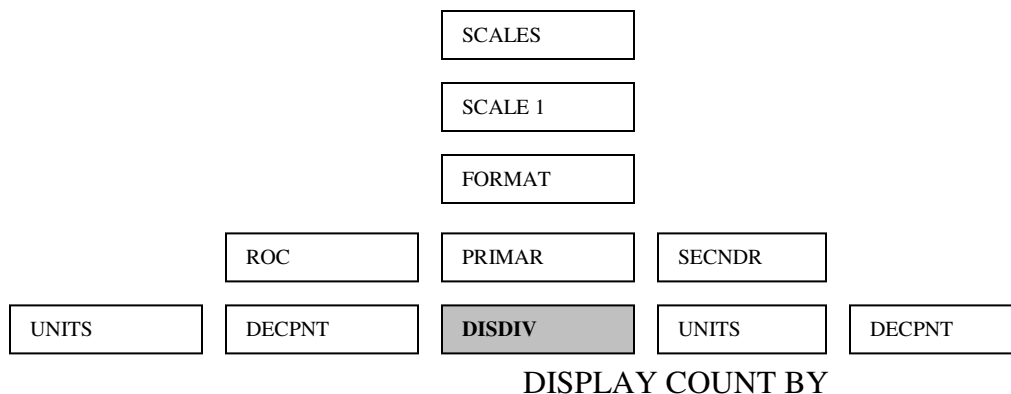
DECIMAL POINT LOCATION

Step 10: Press the down arrow key 1 time. Press the left or right arrow key until “8888880” is highlighted.

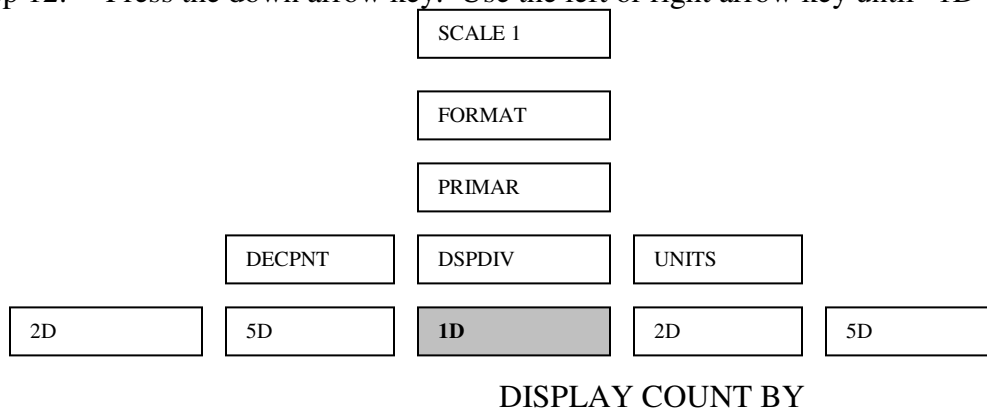


DECIMAL POINT LOCATION

Step 11: Press the PRINT key. The display will shift back to step 8. “DECPNT” should be highlighted. Press the right arrow key until “DSPDIV” is highlighted.



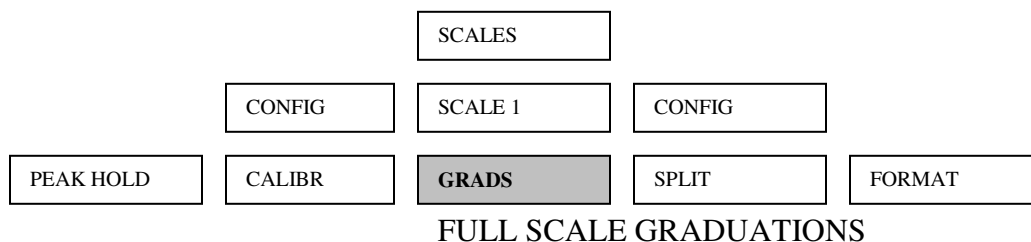
Step 12: Press the down arrow key. Use the left or right arrow key until “1D” is highlighted.



Step 13: Press Up Arrow to Primary. Then press the left arrow to “ROC”. Press down arrow twice to “DECPNT”. Press down and set to 88888880. Press Print.

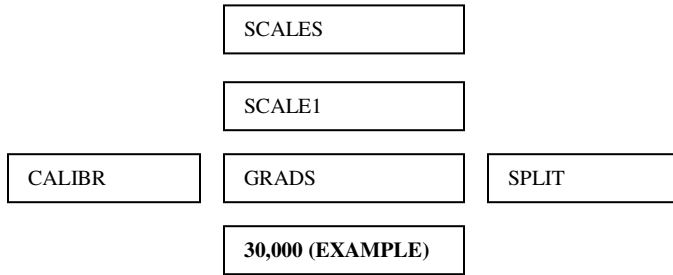
Step 14: DSPDIV will be displayed, press down to set it to “1D” and press print.

Step 15: Press the print key. The display will shift back to the same as in step 10. Press the up arrow key 3 times until “FORMAT” is highlighted. Press the left arrow key 2 times until “GRADS” is highlighted.



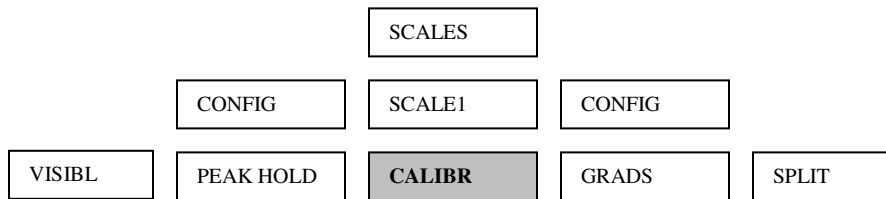
Step 16: Press the down arrow key 1 time. Take the full scale of the testing machine and divide it by 10. Enter that number manually and press the print key.

Example: $300,000 \div 10 = 30,000$



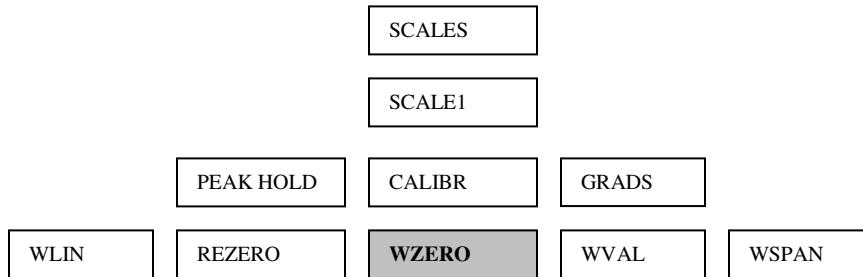
FULL SCALE GRADUATIONS

Step 17: Press the left arrow key 2 times. "CALIBR" will be highlighted.



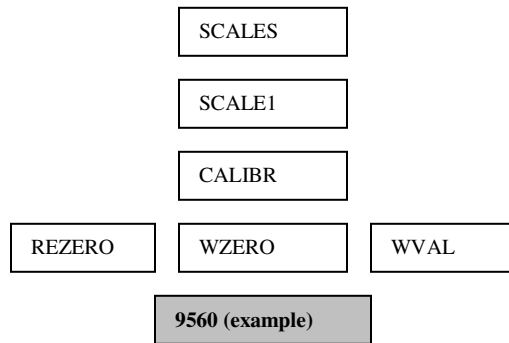
SCALE CALIBRATION

Step 18: Press the down arrow key once. This displays the "DEADLOAD CALIBRATION" menu. "WZERO" is highlighted.



DEADLOAD CALIBRATION

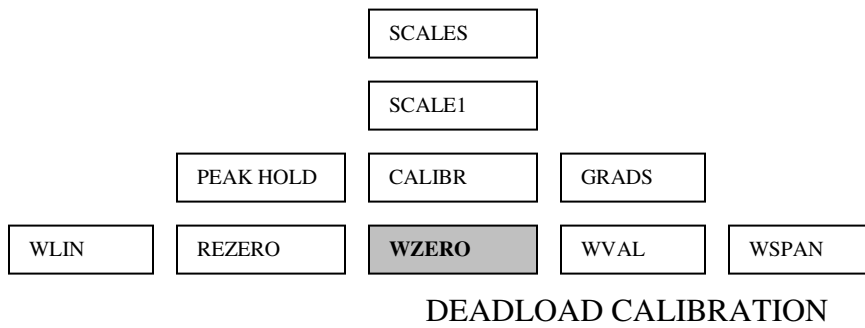
Step 19: “WZERO” is where you set the ZERO calibration point. Press the down arrow key. The highlighted box represents the A/D count for ZERO load value.



DEADLOAD CALIBRATION

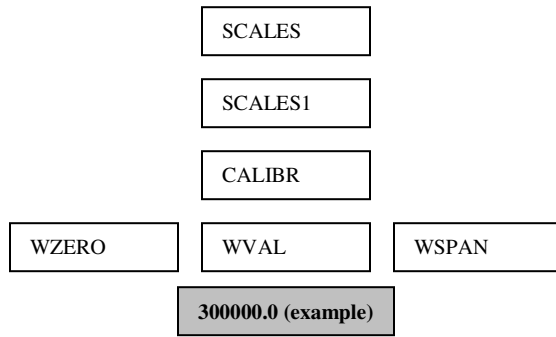
Step 20: Float the piston approximately 3/16” (4.7 mm). Put the control valve in the metered advance position with the flow control valve open approximately half a turn. Press the “CALIBRATE” soft key along the bottom of the display. The display reads “CALIBRATING ...” DEADLOAD CALIBRATION for several seconds. When the word “CALIBRATING...” disappears from the screen, a new A/D count will appear in the highlighted box. The Zero calibration point and corresponding A/D count have now been stored.

Step 21: Press the Print key. This returns the display to the “DEADLOAD CALIBRATION” menu. “WVAL” is highlighted.



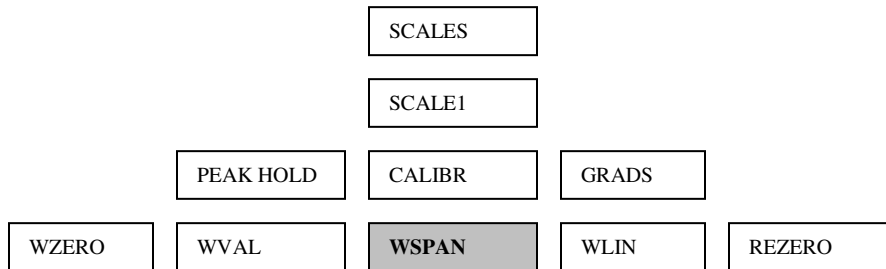
DEADLOAD CALIBRATION

Step 22: WVAL represents FULL SCALE or the capacity of the machine. To enter full scale, press the down arrow key.



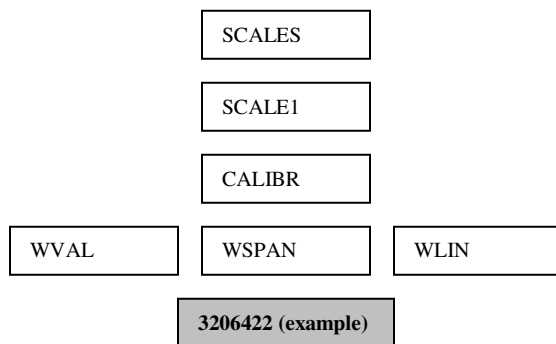
TEST WEIGHT VALUE

Step 23: Use the keypad to enter the FULL SCALE or CAPACITY of the machine. Press the Print key to accept the value. The display will say “Value Accepted” and “WSPAN” will be highlighted.



SPAN CALIBRATION

Step 24: Press the Down Arrow key. The highlighted box represents the A/D count for FULL SCALE load value.



SPAN CALIBRATION

Step 25: Run the machine up to full capacity. Once full capacity has been reached, press the “CALIBRATE” soft key along the bottom of the display. The display reads “CALIBRATING ...” SPAN CALIBRATION for several seconds. When the word “CALIBRATING...” disappears from the screen, a new A/D count will appear in the highlighted box. The FULL SCALE calibration point and corresponding A/D count have now been stored. Press Print.

Step 26: Press the Up Arrow key until “SCALE 1” is highlighted. Press the Save and Exit soft key located along the bottom of the display. The display will now read “*STANDBY* SAVING CONFIGURATION”, and then will return to the testing screen.

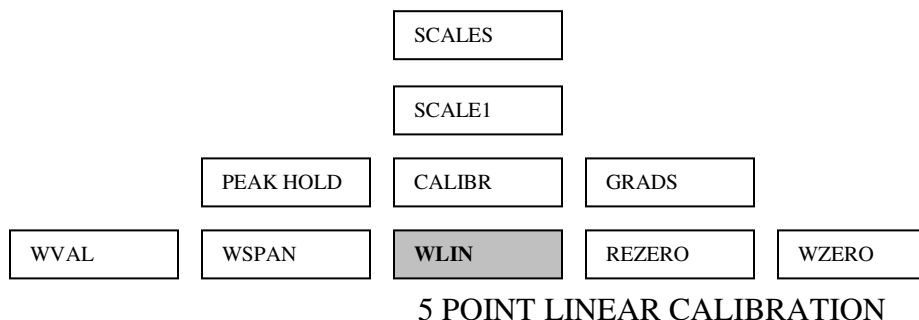
Done. Ready to verify calibration.

To verify calibration accuracy, load machine to specific load points and compare the reading on the Indicator with those of the load cell standard.

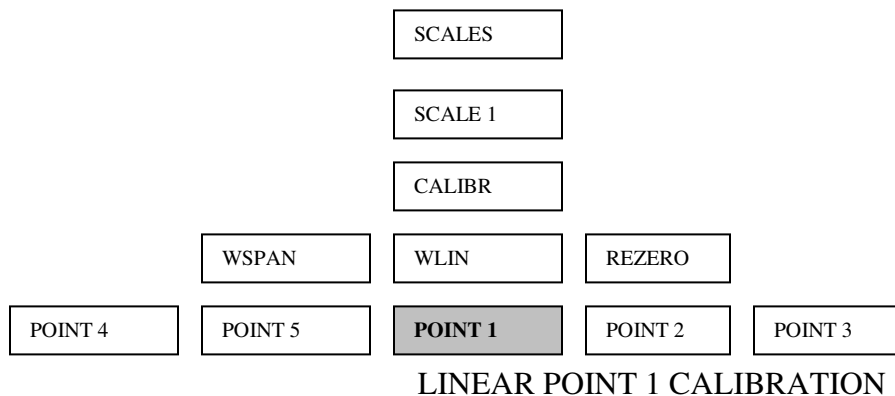
4.1 5 POINT LINEAR CALIBRATION

After setting “0” and FULL SCALE and verifying the calibration, adjustments to the calibration can be made in the 5 Point Linear Calibration program. To access the Linear Calibration program, repeat Calibration Instructions steps 1 through 7. “WZERO” will be highlighted.

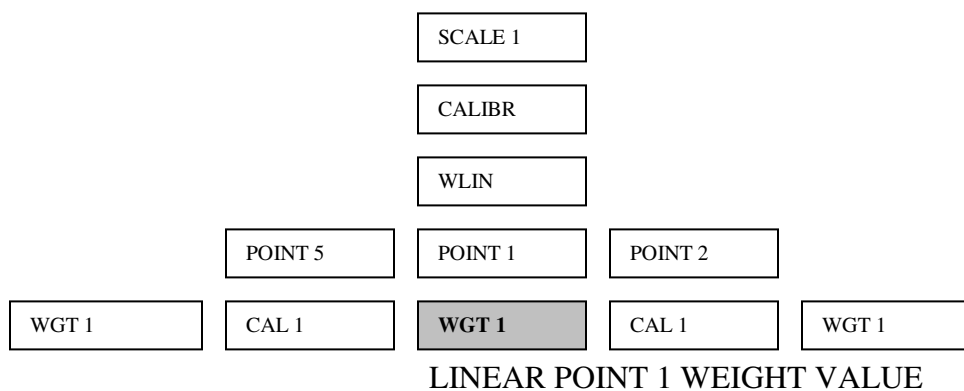
Step 1: Press the Left Arrow key 2 times until ‘WLIN’ in highlighted.



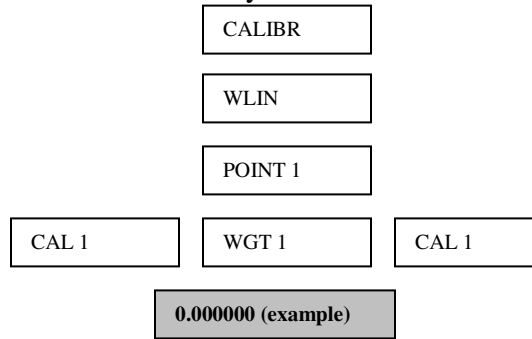
Step 2: Press the Down Arrow key. “POINT 1” will be highlighted.



Step 3: Press the Down Arrow key. “WGT 1” will be highlighted.

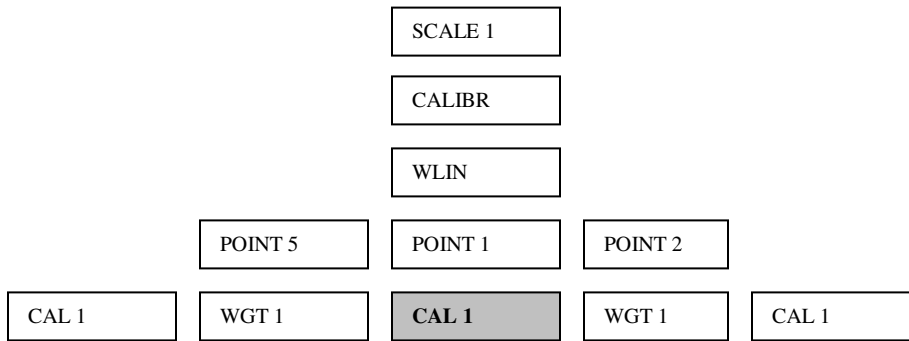


Step 4: Press the Down Arrow key. The numbers in the highlighted box represent Point 1 value.



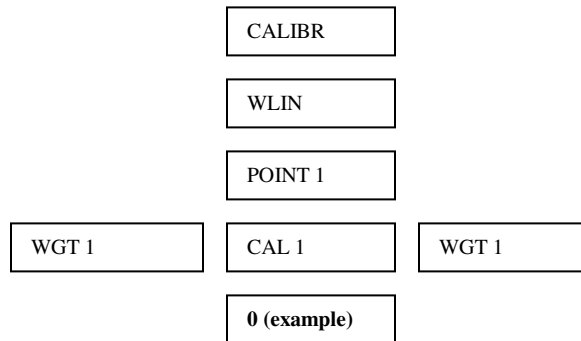
LINEAR POINT 1 WEIGHT VALUE

Step 5: Using the Number keys, enter the value for the first calibration point. Press the Print key to set the value. The display will read “Value Accepted” and “CAL 1” will be highlighted. Note: You can not use “0” or “FULL SCALE” as a value in the 5 Point Linear Calibration program.



LINEAR POINT 1 CALIBRATION

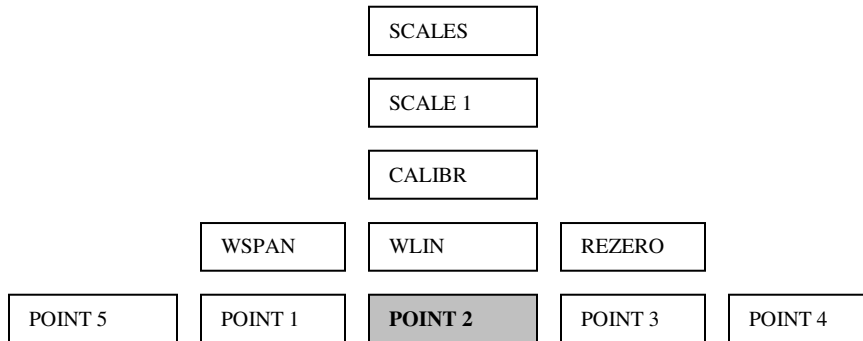
Step 6: Press the Down Arrow key. The number in the highlight box represents the A/D count for point 1.



LINEAR POINT 1 CALIBRATION

Step 7: Advance the machine until you have a load applied to the machine that is equal to the number keyed in as point 1. Press the “CALIBRATE” soft key located along the bottom of the display. The display will say “CALIBRATING” LINEAR POINT 1. The number displayed in the highlighted box represents the new A/D count for point 1.

Step 8: Press the Up Arrow key 2 times until “Point 1” is highlighted. Press the Right Arrow key to move to Point 2.



LINEAR POINT 2 CALIBRATION

Step 9: Repeat steps 3 through 8 to set points 2, 3, 4 and 5.

Note: “0” and FULL SCALE cannot be used in the 5 Point Linear Calibration Program.

Step 10: After all 5 point have been stored, press the Up Arrow key until “SCALE 1” is highlighted, then press the “SAVE AND EXIT” soft key along the bottom of the display.

Step 11: To verify calibration accuracy, load machine to specific load points and compare the reading on the Indicator with those of the load cell standard. To improve accuracy you can adjust any linear point up or down. Refer back to steps 3 and 4. Adjust the settings under “WGT 1” by slightly increasing or decreasing the value.

Note: If “0” is reset in the span calibration, the 5-point linear calibration will be erased.

STATEMENT OF WARRANTY

Test Mark Industries warrants all new testing machines, testing apparatus and supplies manufactured by Test Mark Industries against defects in workmanship and materials for a period of 24 months from the original date of shipment, provided the equipment has been properly installed, maintained and operated in accordance with installation and operating instructions. This limited and exclusive remedy does not cover normal wear and tear. The Test Mark Industries manufactured product must be free from accident, damage by fire, water or act of God to be eligible for warranty.

Test Mark Industries will repair, replace or credit at Test Mark Industries' option defective product or component parts. When repair can be accomplished by exchange of a component part, the customer may be required to remove the part of modular component and install the exchanged part.

Warranty does not cover expenses, either direct or indirect, that may arise from the use or the inability to use Test Mark Industries products, or the secondary owner in the event of resale.

Products not manufactured by Test Mark Industries will carry the warranty of the original manufacturer. Under no circumstances shall Test Mark Industries be liable for any injury, loss, or damages, whether direct or indirect, incidental or consequential, arising out of the use of, or inability to use the products described herein.

This exclusion of liability for loss or damages, whether direct or indirect, incidental or consequential, shall apply to all claims whether sounding in contract, warranty, tort including both negligence and strict liability, or any other basis of liability.