CELL PHONES OR HAND OPERATORED RADIOS
MAY AFFECT ACCURACY DURING CALIBRATION
& OPERATION.

Test Mark Industries, Inc

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LIMITED WARRANTY

Test Mark Industries, Inc. (The Company) warrants that hardware and software/firmware products manufactured by The Company, when properly installed, used, and maintained, will be free from defects in material and workmanship. Test Mark Industries, Inc. warrants a) the SOFTWARE/FIRMWARE will perform Substantially in accordance with the accompanying written materials and b) the HARDWARE will be free from defects in materials and workmanship under normal use and service for a period of (1) one year from date of receipt. The Company's obligations under this warranty will be limited to repairing or replacing, at The Company's option, the part or parts of the hardware and software/firmware which prove defective in material and workmanship within one (1) year from the date of delivery, provided the buyer gives The Company prompt notice of any defect or failure and satisfactory proof thereof. Products may be returned to The Company's factory. The Company will deliver replacements for defective products to the Buyer, freight prepaid to the destination provided for in the original order. With respect to any product or part thereof not manufactured by The Company, only the warranty, if any given by the manufacturer thereof, will apply. It is the responsibility of the Buyer to determine the suitability and safety of this product for any particular purpose. The Company disclaims all liability for incidental or consequential damages. In no case will The Company's liability exceed the original purchase price. THE COMPANY MAKES NO OTHER OR FURTHER WARRANTY, EXPRESS OR IMPLIED, INCLUDING ANY WARRANTY OF FITNESS FOR A PARTICULAR PURPOSE OR WARRANTY OF MERCHANTABILITY.

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SD LICENSE AGREEMENT

This is a legal agreement between you, the end user, and Test Mark, Inc (The Company). By using *SD* you are agreeing to be bound by the terms of this agreement.

1.0 License Grant. The Company hereby grants the end user a personal, nontransferable and non exclusive license to use one copy of the software/firmware and related documentation on a single indicating system.

2.0 Intellectual Property Rights. The Company is the sole owner of all right, title and interest to the *SD* and all copyrights, trademarks, and trade secrets therein. The Company is protected by United States copyright laws and international treaty provisions. Therefore, the end user must treat the software/firmware like any other copyrighted material and may not copy the written materials accompanying the *SD.*

3.0 Restrictions. This Agreement and the Licensed Software/Firmware may not be assigned, Sub-licensed or otherwise transferred by the Customer. The end user must not reverse engineer, decompile, or disassemble the Licensed Software/Firmware or attempt to do so. The Licensed Software/Firmware may not be modified without the written consent of The Company.

4.0 Termination. The Company may terminate the license contained in this Agreement by written notice upon any breach of any term by the end user. Upon termination, the end user shall immediately return the *SD* to the factory. Section 2.0 of this Agreement shall survive termination of this Agreement.

5.0 Purchase by Governmental Agencies. If the end user is a federal, state or local governmental agency or unit, then as a matter of contract, the end user will accord The Company and the Licensed Program the same rights The Company would have had under the Copyright Act of 1976, as amended.

6.0 Governing Law. This Agreement shall be governed by and construed in accordance with the laws of the State of Pennsylvania.

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FOREWARD

SD has been designed and constructed with great care in every phase of assembly. In order to insure reliability, both the mechanical and electrical components have been built with the best available materials. Nevertheless, it has been proven that a thorough understanding of the machine, together with proper attention, will pay big dividends. The sections of this manual provide description and instruction on the operation and maintenance of the mechanical, electrical and software components.

You as a customer are our most valued asset. We take pride in our systems and are proud that you have become an owner. We welcome your comments about our products and wish that you express them. It is the only way that we can continue to build the best available test systems to satisfy your needs. Thank-you for your support.

HOW TO USE THIS MANUAL

This manual is intended to educate the customer on the capabilities, operation and maintenance of the **SD.** In addition, it is to be used as a supplement for any information supplied by the load frame manufacturer. Maintenance procedures specified by the load frame manufacturer should be followed unless specifically noted herein. Read this manual and become familiar with the operation of your test machine prior to operating the **SD.**

TECHNICAL SUPPORT

If a problem should occur:

- First check that all wires, cable and inputs are properly connected. Try cycling the power to the SD to see if this resolves the problem.
- Second call Test Mark Industry's technical support at (330) 426-2200 (9AM to 5PM EST) Monday-Friday.

1.0   INTRODUCTION

SD is a low cost indicator designed to replace dial gauges on materials testing machines. Features include an Auto-Test-Reset mode for hands free operation, bar graph load rate display, permanent storage of test data and easy transfer of results into data base programs. It's accuracy, which exceeds ASTM E4, ease-of-use and ruggedness results in a system of unrivaled price/performance.

SD **is ideal for:**

- Beam Bend Testing
- Concrete Cylinder Testing
- Cement Cube Testing
- Force Calibration
- Remote On-Site Testing
- Quality Control
- Product Evaluation
- Proof Testing

Standard Features:

- Display Live Load, Peak Load and Peak Stress numerically.
- Indicate Load Rate with a bar graph. The rate pointer moves between its limits. Decreasing the rate moves the pointer left. Increasing the rate moves the pointer right.
- Adjust the upper and lower rate limits depending on the testing requirements. Ex: ASTM C39 20-50 psi/sec.
- Select engineering units of Lb, N, KN and Kg. Stress in PSI, Mpa, Kpa and ksc. Length in inches, mm, or cm.
- Define and detect the end of test with the Sample Break Detector.
- Auto-Test-Reset which automatically enables the indicator for the start of the next test without requiring operator interaction.
- Store up to 400 test results to permanent memory. Results include Date, Time, Specimen ID#, Peak Load plus a statistical summary of Peak Load.
- Activate Auto-Store to automatically store the results of each test.
- Activate Auto-Transmit to automatically transmit the results of each test out the serial communications port.
- Transmit results to a printer or remote computer through the serial communications port.
- Store up to four load cell calibrations for multiple load cell systems. The load calibration algorithm allows up to 5 calibration points per cell with piecewise linear fit between points. Accuracy exceeds ASTM E4 Standards and in general is greater than 0.5% from 1% of full scale to full scale.
- Digital output activates at sample break or machine overload.

1.1   **SD** *Options*

- WinCom-SD Windows based serial communications software to import data into spreadsheet and database programs.
- S-Trak, TEST MARK's database and report generation program for concrete cylinders.
- Bar Code Reader input to scan specimen number into the SD.
- Battery Pack for portable applications.
- Shunt Calibration.
- Serial RS-232 Printer.
- Pressure Transducers - 1,000 2,500 5,000 10,000 psi.

1.2   *Printed or Transmitted Reports*

- **Test Results Report.** Test reports with up to 400 results stored to permanent memory is standard. Each test report consists of: date, time, specimen ID#, peak load plus a statistical summary of load.
- **Load Calibration Report.** A load calibration report can be produced for each load cell calibration table which has been accessed. The report consists of the full scale and resolution values for each calibration table in addition to the measured and corresponding load value for each calibration point.

2.0   THE KEYS

2.1   The <TARE/0> Key

The TARE key performs the following functions.
- Defines a new zero load.
- Places the Indicator Test Status in Ready Mode.
- Clears out the previous test results from the test buffer and initializes the indicator for the next test. **Make sure the previous test was stored prior to pressing TARE or it will be lost.**
- Enters the number zero.

2.2   The <STORE> Key

The STORE key writes the current test result which consists of peak load, date, time and specimen ID# to permanent memory then increments the specimen ID#. All results stored to memory can be printed or download to a remote computer.

2.3   The <ENTER> Key

The ENTER key performs the following functions.
- Accepts/assigns the value in a data entry field to that field.
- Turns ON/OFF a menu option.
- Toggle display between Live Load / Live Stress

2.4   The <ESC> Key

The ESC key performs the following functions.
- Returns to the Live Indicating Screen from any menu.
- Clears a data entry mistake by restoring the original number in a data entry field.

2.5   The <UP & DOWN ARROW> Keys

The ARROW keys allow the operator to scroll through menu items.

2.6   The <NUMBER> Keys

The NUMBER keys are used to select a menu option from within a menu or input a numerical value in a data entry field.

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Display while specimen under test: Live Load and Load Rate Pointer shown between High and Low Rate Limits.

Display after specimen break detected (READY): Live Load first line and Peak Load then Peak Stress automatically toggle the second line.
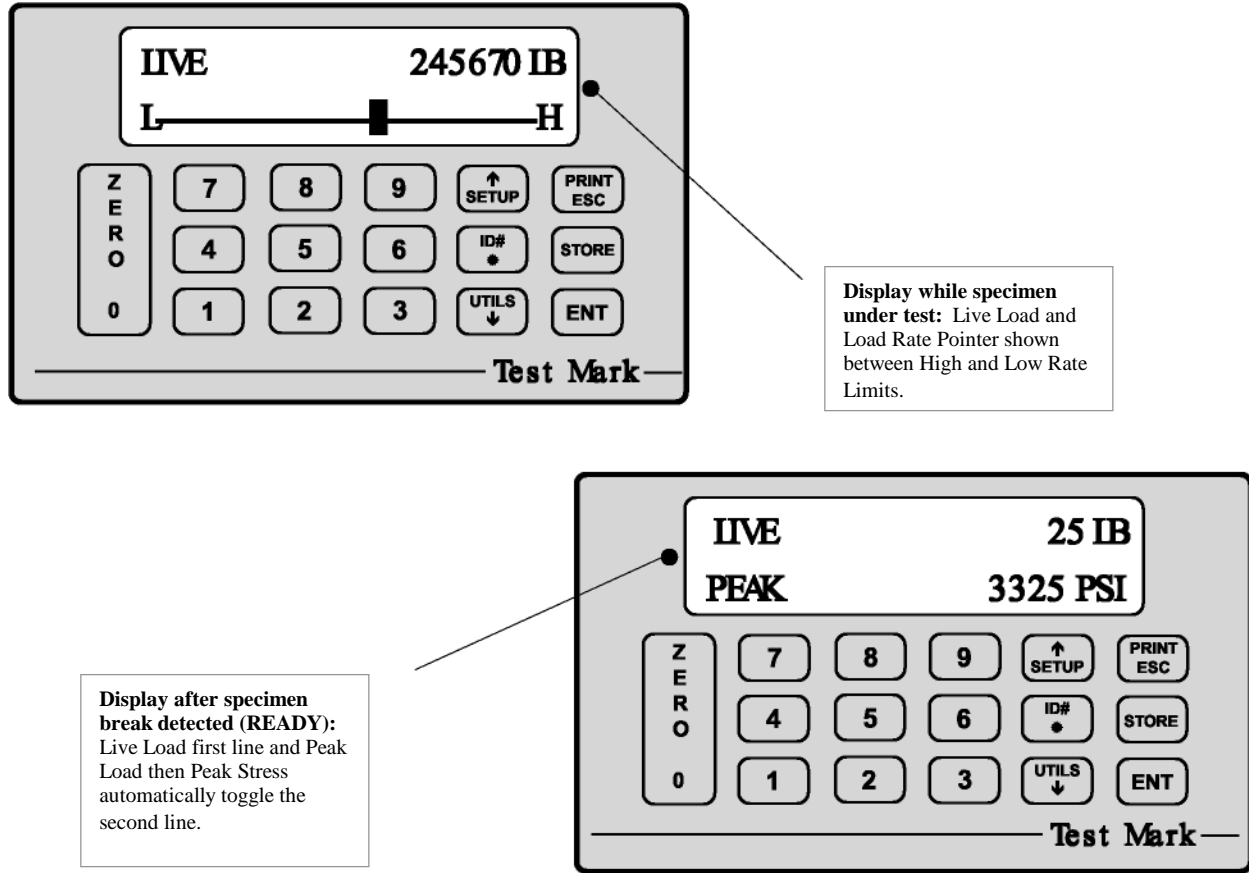
Figure 2.1 - *SD* Keypad and Screen Display.

3.0 THE MENUS

SD
Version 0.1a

ID#	SETUP	PRINT	UTILS	STORE
Input Specimen ID#	<ARROWS> to Scroll. Press Number to Select.	<ARROWS> to Scroll. Press Number to Select.	<ARROWS> to Scroll. Press Number to Select.	Stores Current Test Results (manually)

– 1) Specimen Type	– 1) Raw Data - > WC+	– 1) Clear Results	
– 2) Threshold	– 2) Results - > WC+	– 2) Set Date/Time	
– 3) Sample Brk	– 3) Results - > PRN	– 3) Check Transducer/OUT	
– 4) ID# Prompt	– 4) Print Cals	– 4) Install Defaults	
– 5) Set Rate	– 5) Set Baud Rate	– 5) Calibrate	
– 6) Analysis	– 6) Stream – Com	– 6) Edit Cal Points	
– 7) Set Load Cell		– 7) Report Opt	
– 8) Engineering Units		– 8) Supervisor	
– 9) Store (Auto/Man)			
– 10) Print (Auto/Man)			

Figure 3.1 - *SD* Menus

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3.1 The SETUP Menu

Press the <SETUP> key from the Indicating Screen to enter the SETUP Menu. Use the <ARROW> keys to scroll through the menu items. Use the <NUMBER> keys to select the menu item. The following functions are provided in the SETUP Menu.

1) **Specimen Type.** Select the specimen type for the sample to be tested. After selecting the type of specimen, the appropriate dimensions are requested.

2) **Threshold.** Set the start test threshold in load units. The start of a new test is marked by when the load goes above the threshold value. *SD* employs a 2 line by 16 character display. When a test is not in progress the lower line of the display will show the peak load from the previous test. When the load exceeds threshold, the lower line of the display will change over to rate indication.

3) **Sample Brk.** Sample Break is defined as a percentage of peak load and is used to define the end of a test. If Sample Break = 10 percent and Peak Load = 100,000 Lb, then the test will terminate when the load drops below 10,000 Lb.

4) **ID# Prompt ON/OFF.** Select **ON** for display to prompt for Specimen ID# when storing the test results.

5) **Set Rate.** Defines the lower limit for the rate pointer. The lower limit is marked as an "L" on the rate display line and the upper limit is marked as an "H" on the rate display line during a test.

6) **Analysis.** ENT) Set analysis to display the average load rate at the end of the test along with the peak load.

7) **Set Load Cell.** *SD* will store up to four load cell calibrations in permanent memory for multiple load cell applications. Set Load Cell is used to select which load cell calibration is used for a given test (L0-3). The active load cell is displayed in the upper left hand corner of the Live Indicating Screen.

8) **Engineering Units.** Used to select between 1) load units of Lb, N, KN, and Kg, 2) Stress units of PSI, Mpa, Kpa and ksc, 3) Measurement Units of in, mm and cm, 4) Rate of Load as: Pointer, LB/SEC, LB/MIN, PSI/SEC, PSI/MIN.

9) **Store.** If Store is set to **AUTO**, the results are automatically written to the results buffer and specimen ID# is incremented when sample break is detected. If Store is set to **MAN**, it is necessary to press < Store > at the end of the test to save the test results to memory and increment the specimen ID#.

10) **Print.** If Print is set to **AUTO**, the results are automatically printed after sample break is detected. The *SD* will automatically print column headings when powered up and when exiting the SETUP Menu. If Print is set to **MAN** pressing the < Print > key will print all stored test results.

3.2 The PRINT Menu

Press the <PRINT> key while in the Indicating Screen to enter the PRINT Menu. Use the <ARROW> keys to toggle through the menu. Use the <NUMBER> keys to select the menu item. The following functions are provided in the PRINT Menu.

1) **Raw Data -> WC+.** Transmit the test results stored in the results buffer in text format (not delimited).
2) **Results -> WC+.** Transmit the test results stored in the results buffer in a comma delimited text format (CSV file format). A comma delimited text format allows the file to be properly imported into spreadsheet and database programs. WinCom is a program offered by TEST MARK to capture and save test results on a remote PC. WinCom can also be configured to automatically import the results into a spreadsheet or database program.
3) **Results -> Pn.** Transmit the test results stored in the results buffer in text format (not delimited) to a serial printer.
4) **Print Cals.** Print all load cell calibrations.
5) **Set Baud Rate.**

NOTE: The printer port in the **SD** is an RS232 serial port which can be connected to a serial printer or remote computer. The serial protocol is 9600 baud, 8 data bits, 1 stop bit and no parity. See Section 6.1 for connections to the Serial-I/O port.

3.3 The UTILS Menu

Press the <UTILS> key from the Indicating Screen to enter the UTILS Menu. Use the <ARROW> keys to scroll through the menu. Press the <NUMBER> keys to select the menu item. The following items are found in the UTILS Menu.

1) **Clear Results.** Erase all test results stored in the results buffer. Make sure you have printed the data before erasing memory.
2) **Set Date and Time. SD** is Y2K compliant.
3) **Ck Trans-DOUT.** This function displays the transducer readings in A/D counts and also allows the operator to turn the overrange/sample break digital output ON and OFF. Possible A/D values are between -32768 and +32767. An unloaded load cell should have A/D readings near zero. If the A/D readings are not near zero, check the transducer wiring to determine if it is correct (See Section 6.1).
4) **Install Defaults.** Used to put all setup parameters in a known default state. **Installing defaults DOES NOT effect any of the calibration information.**
5) **Calibrate.** Calibrate a load cell according to ASTM E4 standards. See Section 5.0 for calibration procedures.
6) **Edit Calibration Points.** This function allows the calibrator to modify the load value for a given calibration point.
7) **Report Options.** This function allows the user to select which optional report fields; Job#, Specimen Age, and Weight, to activate. If one or more of these optional fields are turned ON, at the press of the ID# key, the Specimen# prompt appears followed by prompts for each of the active Report Options.
8) **Supervisor On/Off.** When on, only allows operator to change specimen size and specimen ID#.

3.4 The ID# Menu

Press the <ID#> key from the Indicating Screen to input the Specimen ID#. The Specimen ID# can be 8 digits long. Input the Specimen ID# and press <ENTER> to accept the ID#. Note: The Specimen ID# will be automatically incremented after the current test result has been printed or stored. If Report Options in the SETUP menu are turned ON, prompts for JOB#, Spec Age, and Weight will follow the Specimen# prompt.

4.0 OPERATION

Section 4.1 describes how to setup for a test. Section 4.2 describes how to perform a test and store the results to memory. Section 4.3 describes how to generate test reports. Section 4.4 describes how to download the stored test results to a remote PC.

4.1 How to Setup a Test

Step 1:   Press <SETUP> from the Indicating Screen. From the SETUP Menu select the following and enter values for each.

Specimen Type	Specimen type to be tested. Cylinder, Cube, Beam Center, Beam 3rd, Round or Area.
Threshold	Enter a load value which when exceeded will signal the start of a new test.
Sample Break	Enter a number as a percentage of peak load which will define the end of test.
Rate - Low Limit	Enter the lower rate limit, marked as "L" in the rate display.
Rate - Hi Limit	Enter the upper rate limit, marked as "H" in the rate display.
Load Cell	Select the load cell number if necessary.
Engineering Units	Set load units to Lb, N, KN or Kg. Set rate units to per second or per minute.
Store	Auto/Manual
Print	Auto/Manual

See Section 3.1 for more information.

Step 2:   Press <UTILS> from the Indicating Screen. Always clear results from memory. Note: If the stored results are important, print before clearing. See Section 3.3 for more information.

Step 3:   Press the <ID#> from the Indicating Screen. Input the specimen ID#. The specimen ID# will automatically increment after the current test is stored.

4.2 How to Perform a Test and Save Results

If the steps in Section 4.1 were followed, you are now ready to perform a test. The current test settings are saved in permanent memory and will not change unless the operator modifies them.

Step 1:   Insert the specimen in the machine and move the crosshead to the desired starting position. If using a hydraulic machine, float the piston by moving off its stop.

Step 2:   Press the <TARE> key to tare any residual load from the readout.

Step 3:   Begin loading the specimen. Once the load exceeds the start test threshold value, the lower display line will change to the rate pointer and the Sample Break detector is armed.

Step 4:   Once sample break is detected the test is complete and the lower display line will show peak load. If Auto Store or Auto Print is turned ON, the results will either be saved to memory or printed automatically. If Auto Store is turned OFF, press <STORE> to save the current test results. Note: If you do not press <STORE> before pressing <TARE> or the start of a new test, the results will be lost. If Cylinder has been selected as the specimen type, at sample break a prompt will ask the type of cylinder break. Six descriptions are available; Cone, Cone-Split, Cone-Shear, Shear, Columnar and Other. The break type selected will be reported along with the test results.

To continue running tests, repeat Steps 1, 3, 4. *SD* is designed to operate in a "hands free" mode. This means that once it has been setup and properly zeroed, the operator should not have to touch the keypad. If a test result is stored, the specimen ID# will automatically increment.

4.2.1 The Indicator Status

READY and TESTING are the two possible Indicator Modes. Below is a picture of the Live Indicating Screen during each mode.

Display while specimen under test (TESTING): Live Load and Load Rate Pointer shown between High and Low Rate Limits.

Display after specimen break detected (READY): Live Load on first line and Peak Load then Peak Stress automatically toggle on the second line.
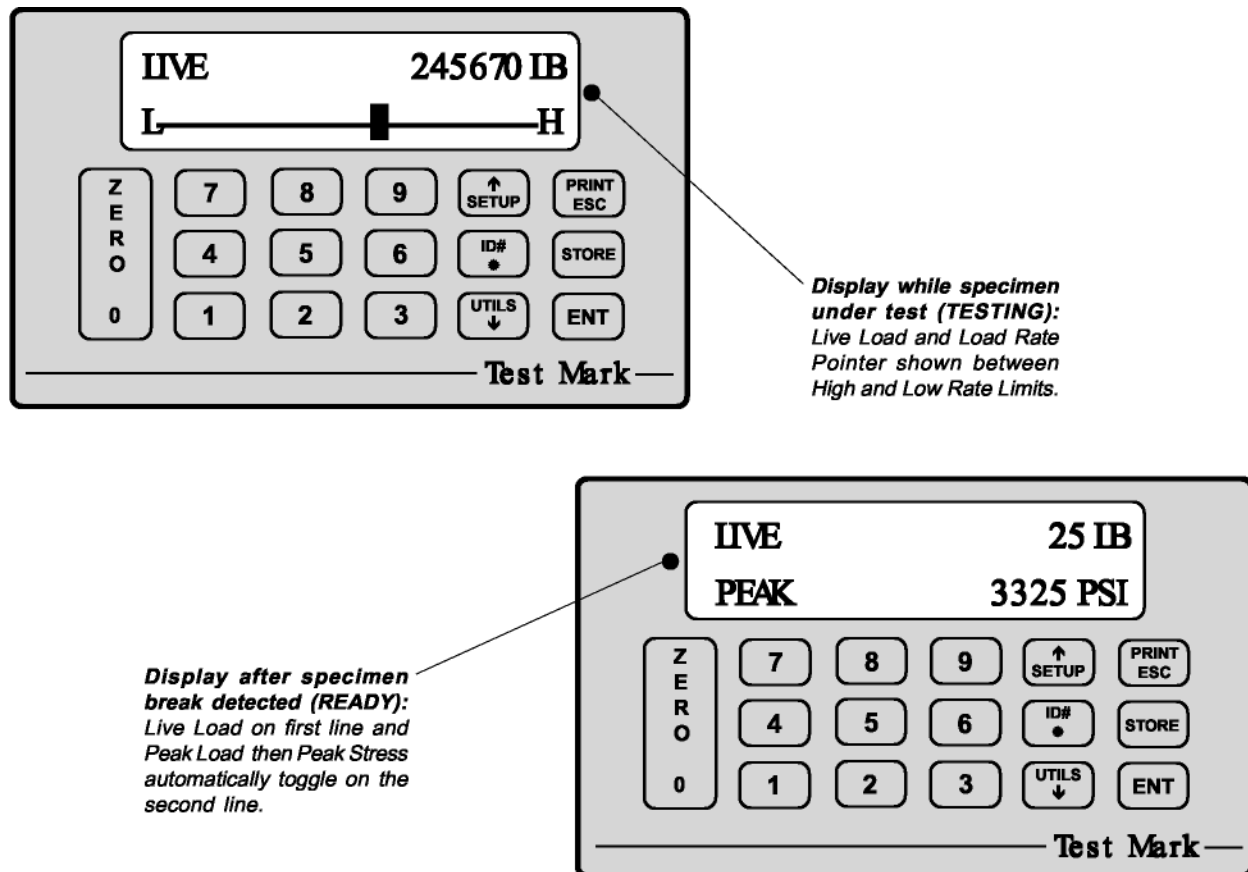
Figure 4.2.1 - The Live Indicating Screen Modes.

4.3 Printing Test Reports to a Serial Printer

The recommended Printer EPSON LX-300+ is both serial and parallel therefore must be programmed as serial before any printing from the SD Digital can occur. Perform the following step:

1. Hook the printer up (make sure you have paper)

2. Hold down the TEAR OFF Key and turn the printer on, the First Report Prints (Language Selections - default is English)

3. Press the TEAR OFF key, Second Report Prints (Current Settings).

4. Press the TEAR OFF key again, Third Report Prints (3 Pages) to tell you how to change settings. The Display of all prompts with associated light settings. You will see two lights (Font and LED) on the left of the printer and one light on the right (Pause). These Light Settings tell you where you need to change what settings.

5. When you find the setting for I/F MODE (9 Settings down or Press TEAR OFF 9 times) then press LF/FF Button to enter change mode.

6.   Lights again indicate what the current setting is AUTO you must change this to Serial. To change to Serial setting you press the LF/FF button until the lights are SOLID – BLINKING – BLINKING, then press TEAR OFF Button to return to Setting list.

7.   When you find the setting for BAUD RATE (2 Settings down or Press TEAR OFF 2 times) then press LF/FF Button to enter change mode.

8.   Lights again indicate what the current setting is 192000 BPS you must change this to 9600 BPS. To change the baud rate setting you press the LF/FF button once or until the lights are DARK – SOLID – SOLID, then press the TEAR OFF Button to return to Setting list.

9.   The Parity and Data Length Settings should be the proper defaults.

10.   When settings are complete simply turn the printer off, wait 5 seconds and turn printer on again. The printer holds all the settings you have just changed and you will be able to print from your SD Digital to the Printer.

If the steps in Section 4.2 were followed, a test report containing all of the results stored to memory can be obtained.

Step 1:   Press <PRINT> from the Indicating Screen.

Step 2:   Press <UTIL> from the Indicating Screen to scroll down the menu.

Step 3:   Turn on your printer and Press <3> Results to Printer to print all stored tests.

4.4 How to Download Stored Test Results to a Remote PC

A data transfer cable and WinCom program diskette manufactured by TEST MARK is required to download test results to a remote PC. Refer to the WinCom program manual for downloading test results to a computer.

4.5 Options

The options listed below are available with SD. Each option will not work unless it has been purchased.

- CHECK CALIBRATION (CKCAL) only works with transducers that employ a wheatstone bridge. It functions by shunting a known resistance across two legs of the bridge to generate a constant output. That output is used to verify that the electronics are functioning properly. The procedure for CHECK CALIBRATION is as follows:

1) Unload the machine and press <ZERO>.
2) Wait a few seconds, then press <ENT>. A non-zero load reading should be displayed for 3 seconds.
3) Note the load reading and compare it to previous calibration checks. Contact your service representative if there is a large difference between readings.

- *BAR CODE READER (Bar Code input)* allows a RS232 serial Bar Code Reader to be used to scan barcode data into the Specimen # field of the test results. TEST MARK can supply the Bar Code Reader, Bar Code Tags and Results Database Software if desired.

5.0 CALIBRATION

Refer to Section 6.1 for details on transducer connections.

LOAD CELL REQUIRED FOR CALIBRATION
CALIBRATION SHOULD BE PERFORMED
BY A CERTIFIED CALIBRATION CO.

5.1 How to Calibrate Analog Transducers

Step 1:   Turn on the system and allow it to run for 10 minutes before calibrating.

Step 2:   Select the Engineering Units for calibration from the SETUP Menu. See Section 3.1 for more information.

Step 3:   Select <5> Calibrate from the UTILS Menu.

Step 4:   Enter the password. Call your equipment manufacturer if you have lost the password.

Step 5:   Enter the load cell number. Use zero if your system has only one load cell.

Step 6:   Input the full-scale range or the capacity of the machine. The range should be input in the currently active engineering units.

Step 7:   Input the resolution or minimum load increment.

Step 8:   Press <1> Calibrate to enter the measure mode or <ESC> to exit. **If you decide to exit the Calibration Menu at this time the values entered for Full Scale and Resolution will be saved.**

Required Information Before Continuing Calibration

The program will enter the measurement mode if <1> is pressed in Step 8. During this mode, the technician can take up to five calibration point readings (a minimum of 2 points is required). ****The first calibration point must be at zero load.** It may be beneficial to take a few more calibration readings in areas of greatest inaccuracy. The number next to "PT" on the display will indicate how many calibration readings have been taken. As the calibration points are entered, write down the corresponding load value. After all five calibration points have been taken, or the <STORE> key is pressed when using less than five points, the *SD* automatically switches to engineering input mode. Input the load value corresponding to each calibration point reading stored. The calibration points are stored sequentially. The first point is zero followed by the second, third and so forth. Once an engineering unit value has been entered for each calibration point stored, the unit will automatically save the calibration.

Step 9:   Unload the machine or place the transducer at its zero point. If calibrating a hydraulic machine, float the piston before taking any readings. Press <ENTER> to take the zero reading. The left side of the display will indicate PT1 has been read.

Step 10: Load the machine to a desired load and press <ENTER> to set a calibration point (voltage measurement). The voltage value is NOT displayed but it has been saved to non-volatile memory. Write down the corresponding engineering unit value for each calibration point. Repeat this step until all readings are taken.

Step 11: Press <STORE> to exit the measurement mode if fewer than five calibration points are used. The program will automatically proceed from Step 10 to Step 12 after the fifth reading.

Step 12: Input the corresponding engineering unit value for each measurement point. After all values have been entered, the program will automatically generate the corresponding scale factors and store them to permanent memory.

### DONE! READY TO VERIFY CALIBRATION

Step 13:   To verify the calibration, exit out to the Indicating Screen and apply specific loads to the machine and compare the reading on the indicator with the standard.

Step 14:   If you desire to adjust one or some of the calibration points, use the Edit Calibration function from the UTILS menu. This function will allow you to edit load values for one, some or all calibration points without forcing you to repeat Steps 2-12.

5.2 What Occurs During Calibration

The calibration procedure allows up to five calibration points to be entered. A straight line connects each successive pair of points and the slope of each line is the calibration scale factor used for that region. This results in a piecewise linear function which maximizes accuracy.
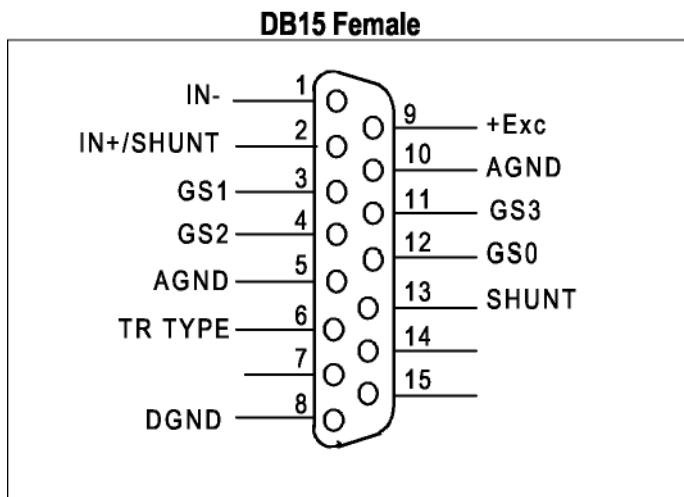
6.0   ELECTRICAL/MECHANICAL DATA

6.1   User Connections
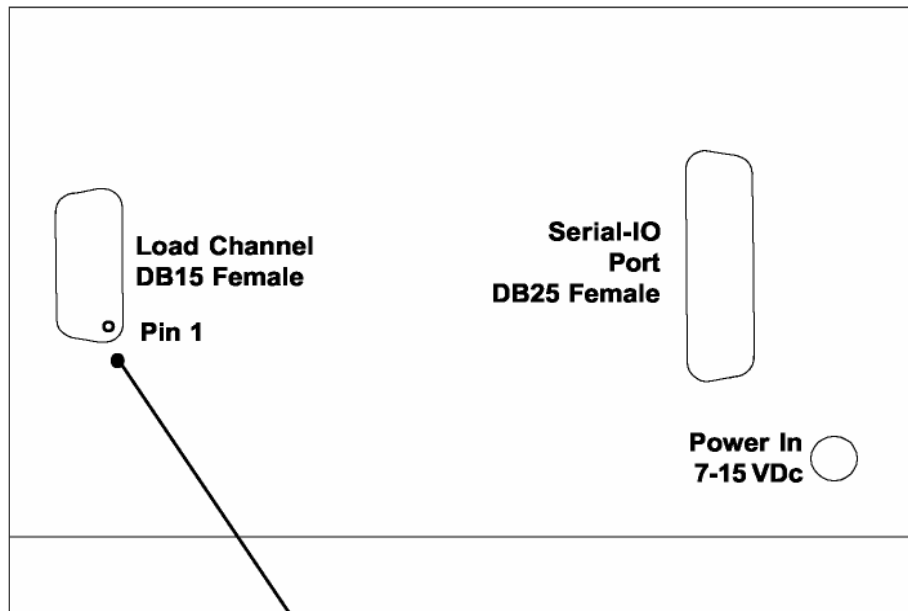
Please note the location of Pin 1

Figure 6.1.1 - *SD* Rear Connection Panel.

DB15 Female

```
        IN-  ──── 1
                     ○  ○  9  ── +Exc
  IN+/SHUNT  ──── 2
                     ○  ○  10 ── AGND
        GS1  ──── 3
                     ○  ○  11 ── GS3
        GS2  ──── 4
                     ○  ○  12 ── GS0
       AGND  ──── 5
                     ○  ○  13 ── SHUNT
    TR TYPE  ──── 6
                     ○  ○  14
             ──── 7
                     ○  ○  15
       DGND  ──── 8
                     ○
```

Load Channel Connections

Analog-Load Input
Analog Excitation:
    pins 9 & 10 (+Exc & AGND)
    5-Vdc

Analog Inputs: pins 1 & 2 (+/- IN)
Analog Input Range:
    up to 2.5 mv/v Tie pin 3 to pin 12
    up to 4.5 mv/v Tie pin 4 to pin 12
    +/- 5 V No Connection
    User definable Tie <25 ppm/C resistor
            between pin 11 & pin 12.
            Gain = 1 + 50000/Rg.
    Connect all shields to chassis.

Transducer Identification (Contact Factory)

Figure 6.1.2 - Analog Transducer Pin Designation.

" WIRING COLOR CODE "
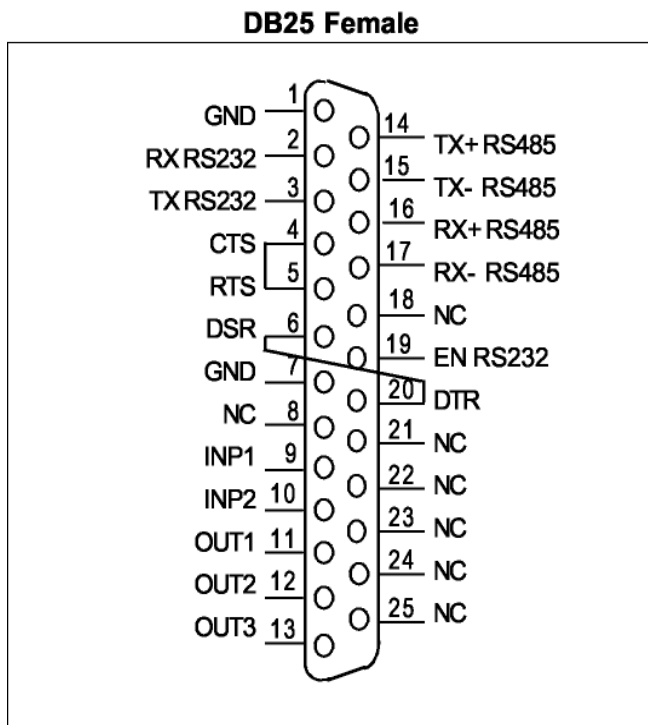
DB-15 Male with Dynisco Transducer

Pin	1	-	Signal	Black Wire
Pin	2	+	Signal	Red Wire
Pin	9	+	Excitation	White Wire
Pin	10	-	Excitation	Green Wire

Bendix Connector

Pins

A	+	Output	Red Wire
B	-	Output	Black Wire
C	+	Excitation	White Wire
D	-	Excitation	Green Wire

DB25 Female

Figure 6.1.3 - Serial-I/O Port Pin Designation

Serial-I/O Port Pin Designations

Digital Outputs: OUT1-OUT3.
Compatiblity: TTL. Connect between output and ground.
Output Assignments: OUT1 - Normally ON,
Turned OFF on load
overrange or sample break.
All other outputs undefined.

Digital Inputs for Load Cell Select:
INP1(pin 9) & INP2 (Pin 10).
Pull to GND to Close.

Load Cell Select Table

	inp1	inp2
LC0	Open	Open
LC1	Closed	Open
LC2	Open	Closed
LC3	Closed	Closed

RS232 Serial Port: Use pins 3 and 7.
Protocol: 9600 baud, 8 data, 1 stop, no parity

For RS485 operation connect pin 19 (EN RS232) to GND

Connect all shields to chassis.

6.2 Serial-I/O Port

The Serial I/O port is used to transmit test results to a serial printer or computer. It also has three digital outputs. Output1 (pin 11) is normally on and will turn off on sample break or load overrange.

6.3 Power (DC) Input

The **SD** requires a 7-15Vdc unregulated input voltage. Contact TEST MARK if the factory supplied power source is not used.

6.4 Mounting Dimensions

3.84

Front View

2x 8-32 Thread

1.00

2.25

Bottom View

4.53

6.25
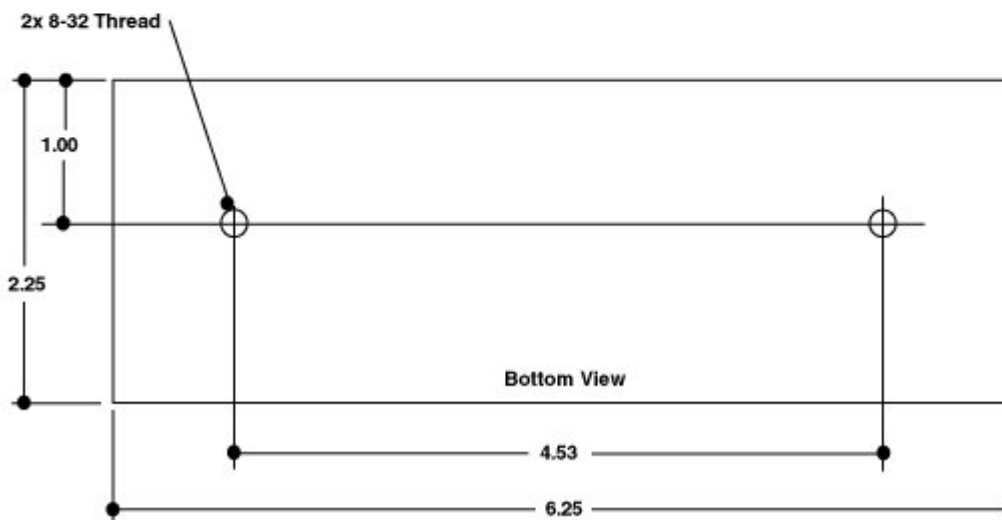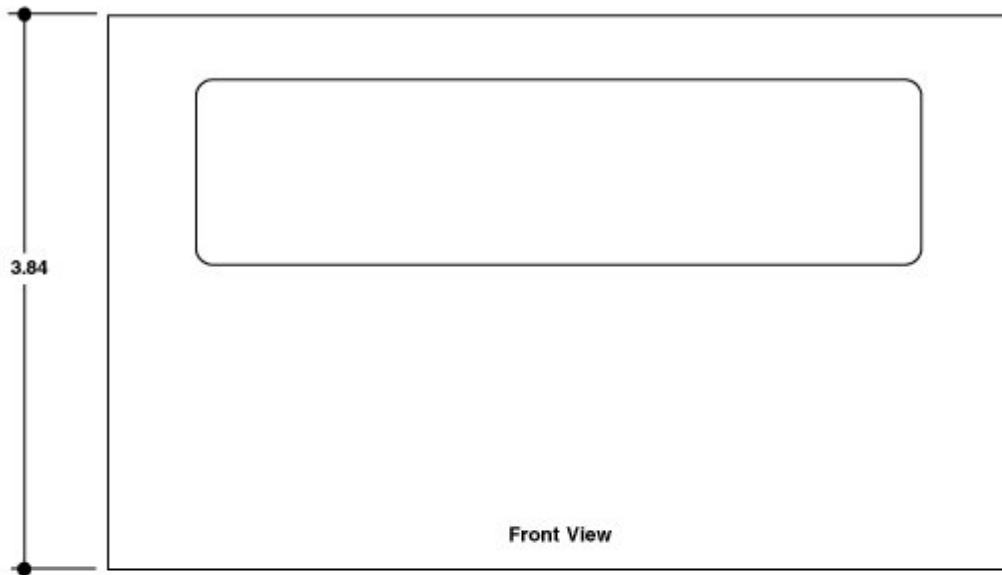
6.5 TROUBLESHOOTING

CORRECTING MINOR PROBLEMS

Some of the most common minor problems and their remedies are listed:

PROBLEM	CAUSE	REMEDY

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.