# LXI

# Digital

# System

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# TABLE OF CONTENTS

**FORWARD**

Test Mark's LXI Indicating System has been designed and constructed with great care in every phase of assembly.  In order to ensure 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 descriptions and instructions on the operation and maintenance of the mechanical, electrical and software components.

You as a customer are our most valued asset.  We take price in our systems and are proud that you have become an owner.  We welcome your comments about our products and wish that you expressed 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 LXI Indicating System.  Read this manual and become familiar with the operation of your test machine prior to operating the LXI Indicating System.

**TECHNICAL SUPPORT**

If a problem should occur with your testing machine:

✓	First check that all external inputs are properly connected.

✓	Second, call Test Mark for technical support at 800-783-3227 or 330-426-2200
	(8AM to 5PM EST)

# 1.0 INTRODUCTION

LXI is a low cost versatile indicator designed for a variety of materials, product, remote on-site and force calibration testing applications. 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.
LXI is ideal for:

- Tension/Compression Testing
- Beam Testing
- Concrete Cylinder Testing
- Cement Cube Testing
- Remote On-Site Testing
- Quality Control
- Product Evaluation
- Proof Testing

## 1.1 LXI Features

- Display Live Load, Maximum Load, Live Stress and Maximum Stress numerically.
- Activate average load rate analysis to calculate and report actual test speeds.
- Select between force units of Lb, N, KN, Kg and stress units of psi, MPa, KPa, ksc.
- Define specimen geometries as cylinder, cube, beam center point loading, beam-3rd point loading, round and general area.
- Activate/De-Activate Cylinder ASTM C39 correction factor.
- Define cylinder break type according to ASTM C39.
- Perform beam tests according to ASTM C78 and C293.
- Store up to 2,000 test results to permanent memory. Results include Date, Time, Specimen ID#, Maximum Load, Maximum Stress, Average Load Rate plus a statistical summary of each.
- Store up to 6 test methods to permanent memory. Test methods enable the user to define and store cylinder, beam and cube test procedures to memory. With the press of a key they can be quickly recalled for fast efficient testing.
- Activate Auto-Store to automatically store the results of each test.
- Auto-Test-Reset is standard and automatically enables the indicator for the start of the next test without requiring operator interaction.
- Define and detect the end of test with the Sample Break Detector.
- Digital output activates at sample break or machine overload.
- Transmit via the USB communications port results, XY data, test methods and calibration data to a remote computer running the optional GageSafe^TM Data Exchange Program.

- Store up to 6 load cell calibrations for multiple load cell systems. The load calibration algorithm allows up to 10 calibration points per cell with piecewise linear fit between points. Accuracy exceeds ASTM E4 Standards and in general is better than 0.5% from 1 % of full scale to full scale.

- *LXI comes standard with one analog input for measuring force and stress. Optional digital encoder and analog inputs can be installed to measure displacement or strain. Ideal for measuring Modulus or Poisson's ratio according to ASTM C469.*

- With the servo control option LXI can be used with the MegaForce Automatic Loading System to ensure that all tests are performed according to ASTM standards. The user specifies the loading rates to achieve precise closed loop control.

## 1.2 LXI Options

- GageSafe$^{TM}$ Data Exchange Software
- Concrete Traker Database Program.
- Battery Pack for portable applications.
- Digital position or analog strain inputs
- Servo control output for MegaForce
- Shunt Calibration.
- Pressure Transducers: 1,000; 2,500; 5,000; 10,000 psi

## 1.3 LXI Reporting Capabilities

**There are two options for exchanging data with the LXI:**

- GageSafe$^{TM}$ Data Exchange Software
- HP Compatible USB printer

**Note that each of these is an option purchased separately from the LXI digital indicator.**

### 1.3.1 GageSafe$^{TM}$ Data Exchange Program

GageSafe is a PC-based program for exchanging data with the LXI. It is a Windows XP/Vista/7 compatible program that is capable of viewing, printing and storing test results uploaded via the USB communications port. The LXI can also upload via the USB communications port Test Methods and Calibration Data. GageSafe can read, create, edit and store Test Methods and Calibration Data. The Test Methods and Calibration Data can then be uploaded back into the LXI via the USB Communications Port . LXI has six Test Methods permanently stored in memory. The user can use the six Test Methods to define procedures for testing cylinders, cubes and beams. With the press of a single key, they can quickly switch between methods for fast efficient testing. GageSafe is sold separately.

### 1.3.2 HP compatible USB Printer

Connect an HP compatible USB printer to the LXI and print a Single Test Report which includes an XY curve, Test Reports that include tabulated results from multiple tests, test methods and calibration data (printer sold separately).

## 2.0 THE KEYS

### 2.1  The <ZERO/0> Key

The ZERO 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 ZERO 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.

### 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.

# 3.0 THE MENUS and KEYS

## 3.0.1 Test Method Specific Menu Selections

The LXI can store up to 6 test methods.
These menu items apply to the current selected test method and need to be set for each test method being used.

```
┌─────────────────────────┐
│      Test Method        │
│   Select Test Method (1-6)   │
└─────────────────────────┘
```

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### Setup Menu

**Use the <Setup> key to access the Setup Menu. Use number keys and Up/Down keys to navigate the menu.**

1) Specimen Type - Available Geometries: Cylinder, Round, Flat, Cube, Beam Ctr, Beam 3rd, X-Area
2) Data Logging - Start logging data threshold
3) Sample Break
   a) Percentage of Peak
   b) Arm Sample Break Threshold
4) Engineering Units
   a) Force - Lbf, N, kN, kg
   b) Stress- psi, kPa, MPa, ksc
   c) Strain - in/in, %, in
   d) Length – in, mm, cm
   e) Age – Days, Hours
5) Rate Display - Available: Load/s, Load/m, stress/s, stress/m, strain/s, strain/m, strain, Posn/s, Posn/m, Posn,
6) Store – manual, auto
7) ID Prompt – off, on
8) Channels – Load Cell, Strain Position

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### Report Options Menu

**Use the <Report Opt> key to access the Report Options Menu. Use number keys and Up/Down keys to navigate the menu. Available test report options are:**

1) Report Options
   Operator ID
   Cylinder Cap Type
   Specimen Age
   Specimen Weight
   Cylinder Break Type
   Cylinder Correction Factor Average Rate
   Yield by Halt of the Pointer
   ASTM C469 Modulus (option)
   ASTM C469 Poisson's (option)

2) Recalculate Results

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### ID# Menu

**Use the <ID#> key to access the ID number Menu. Follow the prompts to input the following information.**

Specimen ID
Specimen Dimensions
Operator ID (if active)
Cylinder Cap Type (if active)
Specimen Age (if active)
Specimen Weight (if active)

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### Control Menu (Option)

**NOTE: This menu is only active in units enabled for operating the MegaForce Automatic Pumping System. Use the <Control> key to access the Control Menu.**
**Use number keys and Up/Down keys to navigate the menu.**

1) Test Rate
2) Preload
3) Preload Rate
4) Start Control
   a) Start Control Load
   b) Start Control Speed
5) Hold Load
6) Control Gains (password protected)
   a) Proportional Gain
   b) Integral Gain
   c) Derivative Gain
   d) Gain Shift
   e) Shift1 (% FS)
   f) Shift2 (% FS)

# 3.0.2 Global Menu Selections

These menu items are not test method specific**.**

<table>
<tr><td>

**UTILS Menu**

**Use number keys and Up/Down keys to navigate the menu.**

1)      Clear Results
2)      Set Date/Time
3)      Ck Trans & IO
4)      Install Def
5)      Supervisor (On/Off)
6)      Stream → XY
7)      Calibrate

</td><td>

**Print Menu**
**Use number keys and Up/Down keys to navigate the menu.**
USB Print (option to local USB Printer)

1)      Current Test
2)      Stored Tests
3)      Individual Test
4)      Print XY Plot
5)      Test Method
6)      Calibration

</td></tr>
</table>

**Disk Menu (Option)**
**Host PC**
**Use number keys and Up/Down keys to navigate the menu.**

1)  XY Data -> Host

2)  Results -> Host

3)  Test Method -> Host

4)  Calibration -> Host:

5)  Traker -> Host:

# 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) **Data Logging.** Specify the Logging Threshold **(Log Thresh)** and the Data Logging Rate (**Log Rate**). Log Threshold is the force value at which data logging begins.
3) **Sample Brk.** Select the threshold for arming sample break (**Brk Thresh**) and sample break percent  (**Sample Break (%)**). Sample Break is defined as a percentage of peak load and is used to define the end of a test. If Break Threshold is 1000lb, Sample Break (%) = 10 percent and Maximum Load  seen during test is 100,000 Lb, then the LXI will be armed for sample break when load  increases over 1000lbs and test will end (data logging stops, Max Load/Max Stress displayed) when load drops below 10,000 lbs, which is 10% of the maximum of 100,000lbs.
4) **Engineering Units.** Used to select between load units of Lb, N, KN, and Kg, Stress units of PSI, Mpa, Kpa and ksc, strain units of in/in, % and in, and rate units on a per second or per minute basis. Length units of in, mm and cm and Age units of days and hours.
5) **Rate Display.** a.)Choose type of load rate display with **Rate-** selection : Select between Load/min, Load/sec, Stress/min, Stress/sec, Strain/sec, Strain/min, Strain, Posn/sec, Posn/min, Posn.
6) **Auto Store.** If **Store** is set to AUTO, the results are automatically written to the results buffer and the specimen ID# is incremented when sample break is detected. If **Store** is set to MAN, it is necessary to press the <STORE> at the end of test to save the test results to memory and increment the specimen I D#.
7) **ID Prompt** – Off, On
8) **Channels -** Used to select load cell, strain and position. You can select between valid load cell calibrations set up in the calibration menu.

# 3.2 The Report Opt Menu

Press the <Report Opt> key from the Indicating Screen to enter the Report Options/Analysis 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 Report Opt Menu.

1) **Report Options.**    Choose which analyses to activate.  Use <Arrow> keys to scroll through items. Toggle (1) key to activate preferred option.

    Available options include:

| | |
|---|---|
| **Oper ID**: | Operator ID. |
| **CylCapType**: | Cylinder Cap Type |
| **SpecAge**: | Specimen Age |
| **Spec Wt**: | Specimen Weight |
| **CylBrkType**: | Cylinder Break Type |
| **CylCorFact**: | Cylinder Correction Factor |
| **Statistics**: | Statistics |
| **Avge Rate**: | Average Rate Calculation |
| **Yld Halt**: | Yield by Halt of Force |
| **Avge Rate**: | Average Rate Calculation |
| **C469 Mod**: | C469 Modulus of Elasticity |
| **C469 Pois**: | C469 Poisson's Ratio |

2) **ReCalc Results**.    Recalculates all analyses.

## 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.**
3) **Ck Trans-DOUT and I/0.** This function displays Input/Output status as well as the transducer readings in A/D counts. Possible A/D values are between -2,200,000,000 and +2,200,000,000.
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) **Supervisor.** Select Supervisor ON or OFF. This is a password-protected field. With Supervisor set to ON, the user has **full access to all menus. With Supervisor set to OFF, the user has access to the ID# field only.**
6) **Stream.** Toggle to ON to stream XY data to GageSafe Data Exchange program.
7) **Calibrate.** Calibrate a load cell according to ASTM E4 standards. See Section 5.0 for calibration procedures.
   **Edit Calibration Points.** This function allows the calibrator to modify the load value for a given calibration point.
   NOTE: The calibrator can also edit A/D counts in the calibration. Select **Install Def** from the **Utility** menu. The screen will read **1) Install; ESC) Exit**. Press the "**9**" key to get into the edit A/D count screens.

## 3.4 The ID # Menu

ID number can be 8 digits long. Input the Specimen ID number and press <ENTER> to accept . Note: The Specimen ID number will be automatically incremented after the current test result has been printed or stored. You will then be prompted to enter dimensional information for your selected specimen. Prompts for any items enabled in the Report Options menu will follow the specimen dimensions prompt.

## 3.5 The Print Menu

NOTE:  This menu is used to print hard copy printouts to an HP compatible USB printer. The USB printer option and the printer are purchased separately.

Press the <Print> key from the Indicating Screen to enter the Print 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 Print Menu:

1) **Current Test**.  Transmits the current test result to the printer.
2) **Stored Tests.**  Transmits stored test results to the printer.
3) **Select Test.**  Transmits one specified test result to the printer.
4) **Prn XY Plot.**  Transmits XY plot to the printer.
5) **Test Method.**  Transmits the current test method to the printer.
6) **Calibration.**  Transmits calibrations to the printer.

# 3.6 The Disk (-) Menu

## Host PC

The Host PC menu contains options for transmitting data to the GageSafe Data Exchange Program, which is not included with the LXI and must be purchased separately.

**NOTE:**  You can upload test methods and calibrations from GageSafe as well. These actions are initiated from within the GageSafe program and described in the GageSafe manual.

The following items are found in the **Host PC** menu:

1)  **XY Data -> Host.**   Transmit XY data from the current test to GageSafe.
2)  **Results -> Host.**   Transmit stored test results to GageSafe.
3)  **Method -> Host.**   Transmit Test Methods to GageSafe.
4)  **Cal -> Host.**      Transmit calibration to GageSafe.

# 4.0 OPERATION

## 4.1 How to Setup a Test

You can store up to 6 test methods in the LXI. Test methods can be transferred to and from the GageSafe Data Exchange software in units that are equipped with these options.

- 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.

**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 Ctr, Beam 3rd, Round or Area.
**Data Logging:** Set Logging Threshold. When the logging threshold load value is exceeded, data logging begins and the test starts. Set the Data Logging rate appropriate to your test. As data logging rate increases, total test time buffer decreases. The total test time for each data-logging rate is displayed in menu item.
**Sample Break:** Set the Break Threshold to a load value where you want the LXI to be armed for sample break. This value needs to be greater than the data-logging threshold.
Set Sample Break % to value to where you want to define the end of test.
For example, if Break Threshold is 1000lb, Sample Break (%) = 10 percent and Maximum Load seen during test is 100,000 Lb, then the LXI will be armed for sample break when load increases over 1000 lbs and test will end (data logging stops, Max Load/ Max Stress displayed) when load drops below 10,000 lbs, which is 10% of the maximum of 100,000lbs.
**Rate Display:** Set Rate Display to force/sec; force/min; stress/sec; or stress/min.
**Engineering Units**: Set load units to Lb, N, KN or Kg. Set stress units to psi, kPa, MPa, or ksc. Set length units to in, mm or cm, Set Age units to Days or Hours
**Auto Store:** Select if you want to automatically store every test result.
**Load Cell:** Select the load cell number if necessary.
See Section 3.1 for more information.

**Step 2:** Press <UTILS> from the Indicating Screen. 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. If any Report Options have been turned ON, additional prompts will follow.

## 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 it's stop.

**Step 2:** Press the <ZERO> 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 specified rate display (load/stress rate). Once the load exceeds the break threshold 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 is turned ON, the results will be saved to memory. If Auto Store is turned OFF, press <STORE> to save the current test results. Note: If you do not press <STORE> before pressing <ZERO> or the start of a new test, the results will be lost.

To continue running tests, repeat Steps 1, 3, 4.

*NOTE*: **The LXI** 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.
READY and TESTING are the two possible Indicator Modes.

## 4.3 Printing Test Reports to a HP compatible USB Printer

If the steps in Section 4.2 were followed, a test report containing all of the results stored to memory can be obtained.
**NOTE:** The USB printer is purchased separately.

**Step 1:** Press <PRINT> from the Indicating Screen to see available print options. Print current test, stored tests, one specified stored test, or XY plot to printer
More information in section 3.5

## 4.4 Download Test Results to a Remote PC

A data transfer cable and GageSafe Data Exchange Software is required to download data to a remote PC. Refer to the GageSafe Data Exchange program manual for downloading data to a computer.

# 5.0 CALIBRATION

Refer to Section 7.1 for details on transducer connections.

## 5.1 How to Calibrate Analog Transducers

You can calibrate up to 6 load cells to the LXI. There can be up to 10 points in each calibration.

**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 <7> **Calibrate** from the **Utils** Menu.

**Step 4:**   Enter the password. Contact Test Mark technical support 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 > **Set Cal Points** to enter the measure mode or <ESC> to exit.

> **NOTE:**   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 ten calibration point readings (a minimum of 2 points is required).

> **NOTE:   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 "**Set PT No**" 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 ten calibration points have been taken, or the <STORE> key is pressed when using less than ten points, the LXI 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.

**NOTE:**  Display will prompt for **Set PT No 0** when setting the first point. The first point in the calibration MUST be zero load. After all of calibration points have been stored, the first Engineering unit value entered will be 0. The prompt for this will be **PT(1)**.

**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 nonvolatile memory. Write down the corresponding engineering unit value for each calibration point. Repeat this step until all readings are taken.

**Step11:**  Press <STORE> to exit the measurement mode if fewer than ten calibration points are used. The program will automatically proceed from Step 10 to Step 12 after the tenth reading.

**Step12:**  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

**Step13:**  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.

**Step14:**  If you choose 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 ten 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.

## 5.3 Saving Calibration Data

All calibration data can be transferred to and from the GageSafe Data Exchange software. Calibration data can also be printed to HP compatible USB printer in units that are equipped with these options.

# 6.0 TROUBLESHOOTING

| LXI Troubleshooting | | |
|---|---|---|
| **Problem Description** | **Possible Causes** | **Action** |
| Not holding peak load<br><br>OR<br><br>Not tracking load while machine actually loading and breaking sample. | Sample break threshold And sample break % settings | **NOTE:** The LXI digital goes into TESTING MODE when the actual load exceeds the programmed load threshold value. When the LXI Digital is in the TESTING MODE, the live load is displayed on the upper right and the load rate is displayed in the bottom of the display. If you do not see the the numeric load rate in the bottom display then you are NOT in the testing mode and you need to look at your data logging threshold value.<br><br>Ensure that the Break Threshold (**Sample Brk** menu item in the **Setup** menu) is set to a value that is appropriate for the test. Break Threshold is the point where the LXI digital is armed for sample break. If the break threshold is too low then a load drop in the early part of the test could trigger the LXI to detect premature specimen break (end of test) and stop logging data. For example, if the Break Threshold is set to 10lbs (much too low) and the sample break percentage is set to 50% and the load climbed to 20lbs and then dropped to 10lbs the LXI would detect sample break, stop logging data and report a peak load of 20lbs.<br><br>Ensure that Sample Break (SETUP, End of Test menu) is set appropriately. 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. Setting sample break percentage to 0 disables it so the LXI will continue logging data until the test buffer is full. If the sample break percentage is set too high then end of test can be triggered early. |
| | Applying Load too quickly after taring LXI | **NOTE:** The LXI is designed for hands-free operation. You should only need to zero the digital once. It is not necessary and NOT recommended to zero the digital prior to each test. Doing so can prevent the digital from going into Testing Mode and not recording the peak load. If you do not see the rate bar or load rate display on bottom line of the display it then the digital is not going into testing mode.<br><br>Ensure that you are that you are waiting at least 3 seconds after zeroing digital before running a test (applying load to your break machine). |

## LXI Troubleshooting (cont'd)

| Problem Description | Possible Causes | Action |
|---|---|---|
| Load reading wrong | Calibration | Ensure that correct load calibration is selected. The Active Calibration # is displayed in the upper left of the live screen. The LXI can store up to six load cell calibrations. |
|  | Analog/Digital Electronics | Contact Test Mark technical support. |
|  | Excitation Voltage bad. | Contact Test Mark technical support. |
|  | Load Transducer Cable | Replace/fix transducer cable<br>NOTE: refer to See Electrical/Mechanical Data section of this manual for cable wiring information. |
|  | Load Transducer | Replace load transducer |
| Stress reading wrong | Specimen Information | Stress is a calculated value. It is equal to the load divided by the programmed specimen cross-sectional area.<br><br>Ensure that **Specimen Type** and specimen dimension information is correct in the **SETUP** menu. |
| Load reading unstable | Calibration | Ensure that there is valid calibration in selected load channel. A valid calibration has at least two points, the first point MUST be zero, appropriate full scale and resolution settings, and a good A/D count span between the points in the calibration. |
|  | Analog/Digital Electronics | Contact Test Mark technical support. |
|  | Excitation Voltage bad. | Contact Test Mark technical support. |
|  | Load Transducer Cable | Ensure that cable gain strap is properly wired for transducer being used.<br>Replace/fix transducer cable<br><br>NOTE: refer to See Electrical/Mechanical Data section of this manual for cable wiring information. |

# 7.0 ELECTRICAL/MECHANICALDATA

Figure 7.1.1 – LXI Rear Connection Panel.

## 7.1 User Connections

**GageSafe Communication Port**



Not used

Printer Port

Strain Channel

Load/Enc Channel

Power Switch

Not used
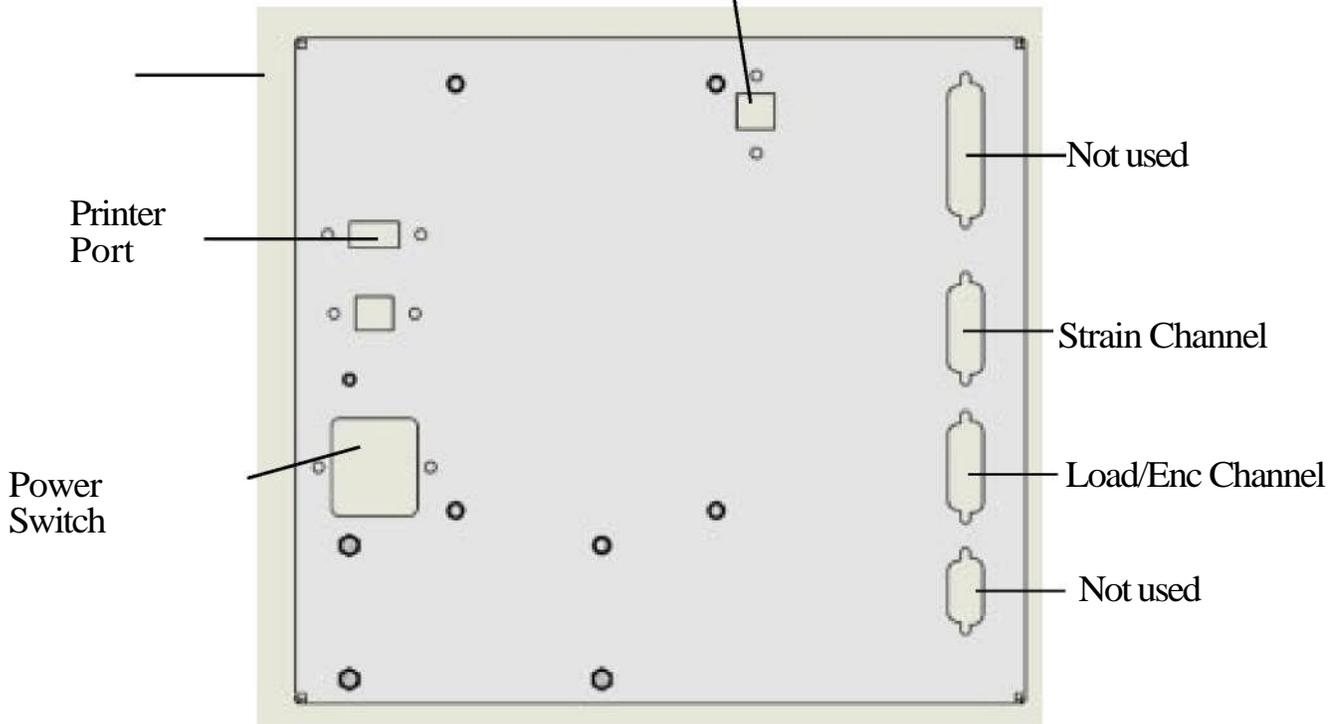
**DB15 Female**

**Analog Channel Connections**



| Pin | Signal |
|-----|--------|
| 1 | IN- |
| 2 | IN+/SHUNT |
| 3 | GS1 |
| 4 | GS2 |
| 5 | |
| 6 | TR TYPE |
| 7 | ENC 5V |
| 8 | DGND |
| 9 | +Exc |
| 10 | AGND |
| 11 | GS3 |
| 12 | |
| 13 | |
| 14 | ENC A |
| 15 | ENC B |

**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.
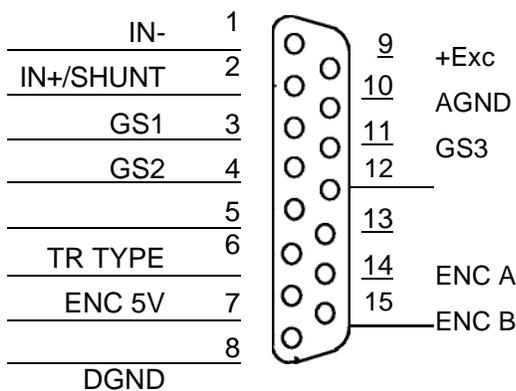
**Transducer Identification** (Contact Factory) Figure 7.1.2 - Analog Transducer Pin

Designation.

## 7.2 USB Port

The USB port is used to transmit exchange data with either an HP compatible USB printer, or GageSafe Data Exchange software.

## 7.3 Power (AC) Input

The LXI Power requirements: 85 to 265 VAC (50 - 60Hz).

## 7.4 Password

**Factory Password: 678**
Use this for calibration and other password protected areas.

Test Mark suggests removing this page from the manual and placing it in a safe place.

# Index