



**Quality Assurance Instrumentation  
Precision Assembly Automation**

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**ELECTRONIC TORQUE TESTER  
MODEL: STH3**

Software version 4.1

**Company Name**  
**SN: Serial number**



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*SURE TORQUE, INC. - World-Wide Torque Testing Equipment Specialists!*



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**OPERATION MANUAL**

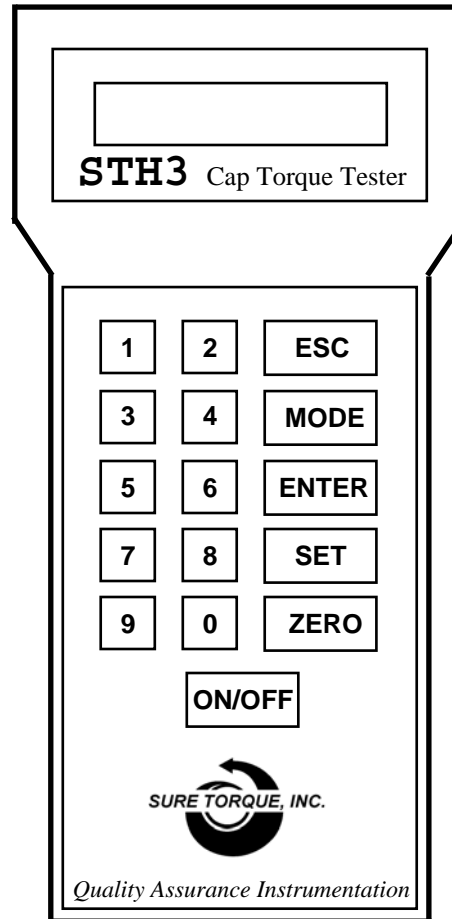


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# Operating Instructions

## CONTROLS AND INDICATORS

The STH3 Torque Tester Control Unit has operator controls and indicators necessary for torque testing functions. Refer to Figure 2-1, STH3 Controls and Indicators, for a drawing of all operator's controls and indicators, listing their types and functions.



STH3 Controls and Indicators.

## OPERATOR CONTROL FUNCTIONS

There are 16 push buttons available to the user to operate the STH3 *Sure Torque Control Unit*.

### ESC Button

This button is used to escape to the next higher-level item in the menu.

### MODE Button

This button is used to select the mode of operation.

### ENTER Button

This button functions as an "acknowledgment of operation", or to "go forward". By pressing this button in Peak mode the displayed data is stored in the memory.

### SET Button

By pushing this button you can enter a new value for the displayed data.

### ZERO Button

This button is used to get a zero reading on the display when there is no torque applied to the transducer. Also used to erase the stored data from the memory.

#### **ON/OFF Button**

This button is used to turn the power on or off to the unit.

#### **NUMERIC keypad**

These buttons are used to enter a numeric value.

### **DISPLAYED MESSAGES, OPTIONS AND INSTRUCTIONS**

#### **Display**

All operator controls and messages are conducted via the 2 X 16 Character message center and the sixteen (16) program keys under the display.

The modes and messages are programmed into a computer chip. Depending on the options the customer selected at the time of purchase, these modes may or may not be installed in the equipment.

#### **Power On**

At Power On the

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Message appears on the display for a few seconds. Then the unit automatically enters the peak torque measurement mode.

#### **The Main Menu**

The Main Menu contains the main features of the STH3 torque tester. Selection of a mode is done by pressing the MODE button. From the Main Menu the user may select **Continuous**, **Peak**, **Data Analysis** or **Calibration Mode**.

#### **Peak Mode**

(Selected from the Main Menu).

PEAK

TORQUE: 0.0

Message appears on the screen. In this mode the STH3 is displaying the highest torque that was applied to the transducer since entering the mode or since the "ZERO" button has been pushed. The "+" sign indicates Clockwise, the "-" sign indicates Counter Clockwise torque. If the torque drops below the *low torque limit* after reaching a higher peak, the STH3 will store the peak value in the memory, send it to the attached computer or printer through the RS232 port and reset itself for the next test. By pressing the "SET" button in this mode you can change the *low torque limit*. Press "ENTER" then type in the desired value on the numeric keypad. Press "ENTER" again when you are finished.

#### **Continuous Mode**

(Selected from the Main Menu).

CONTINUOUS

TORQUE: 0.0

Message appears on the screen. In this mode the STH3 is continuously displaying the torque that is being applied to the transducer. The "+" sign indicates Clockwise, the "-" sign indicates Counter Clockwise torque. Use the "ZERO" button if the reading is not zero when there is no torque applied to the transducer.

#### **Data Analysis**

(Selected from the Main Menu).

DATA ANALYSIS

Message appears on the screen. Press the "ENTER" button to enter this mode. The number of the data points stored in the memory will appear on the display. Hit the "ENTER" button to view the minimum and maximum torque values. Hit the "ENTER" again to view the average torque and the standard deviation. Press "ENTERS" again. The unit will display:

DATA TO RS232  
ESC OR ENTER

Press "ENTER" if you wish to send all data points and results to the serial printer or computer connected to the RS232 port of the STH3 unit. Pressing "ESC" will take you back to the number of data points screen.

By pressing the "ZERO" button you can erase all the data from the memory to make room for the next test results. After pressing the "ZERO" button hit "ENTER" if you don't need the data stored in the memory any more, or "ESC" if you do. By pressing the "SET" button, the STH3 will display the current time and date. If you wish to change the time or the date, press, "ENTER". At the blinking cursor enter the values utilizing the numeric keypad. Make sure to use leading zeros for one-digit values (e.g. "08"). Use "1" for entering "AM", "2" for entering "PM". Press "ESC" when you are finished.

### **Calibration**

(Selected from the Main Menu).

#### **CALIBRATION**

Message appears on the screen. Press the "ENTER" button to enter this mode. The 59K OHM GAIN value will appear. This parameter has been pre-entered from the transducer calibration record. It should only be altered if a new transducer has been installed to the unit. This value has to be exactly the same as the one on the "Fact sheet" in this manual. Press "SET" if you need to change this number. At the blinking cursor enter the new value utilizing the numeric keypad. Press "ENTER" when you are finished or when you don't wish to change this number. The 100% GAIN value will appear. It should only be altered with the instructions provided in the optional Certified Calibration Kit. Press "SET" if you need to change this number, press "ENTER" if you don't. Pressing "ENTER" will advance to the Calibration display. In this mode the transducer is directly connected to the display for continuous observation and calibration of the STH3 torque tester. The actual certified system calibration with accurate weights is done in this mode. If you purchased the optional calibration kit, please see the instructions Appendix A. Press "ESC" to leave this mode.

### **RS-232 Interface**

Serial Port for data transmission to a remote computer or to a printer through a 9-pin connector. Data is in ASCII format with CR, LF Delimiter. Protocol: 9600 Baud, 8 Data bits, 2 stops, no parity (Cable to PC Serial Port is included).

### **Real Time Clock**

Logging actual time and date of occurring data. Along with the data, the STH3 stores and later downloads the time and date of the measurement.

### **STDA (Sure Torque Data Acquisition - Optional)**

Windows compatible software package for data collection from STH3 RS-232 Port. If you have purchased this option refer to the Appendix A in this manual for details.



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**Appendix A**

Certification Records  
Calibration Procedure



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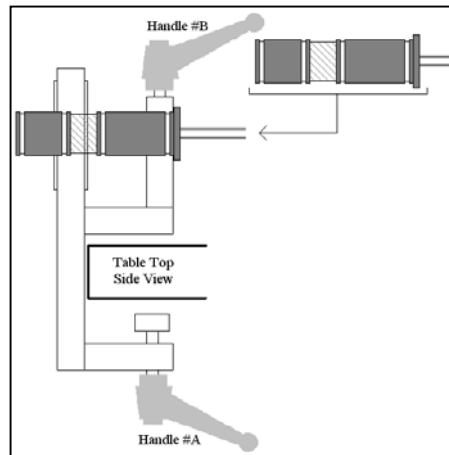
# STH3 CALIBRATION PROCEDURE

## FIXTURE PLACEMENT

1- Using handle #A, secure the Calibration Fixture to the edge of a sturdy, level tabletop.

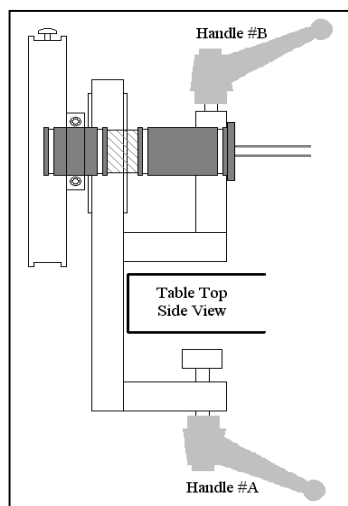
## TRANSDUCER TRANSFER AND PLACEMENT

- 1- Loosen the three set screws in the Outsert that is attached to the transducer of the STH3.
- 2- Remove Outsert.
- 3- Loosen the two socket head cap screws in the handle housing.
- 4- Carefully remove the transducer from the handle.
- 5- From over the table, carefully slide the transducer all the way into the calibration fixture.
- 6- Tighten handle #B lightly until the transducer is secure.



7- Select the proper pulley (2" or 4") needed from the STH3 Calibration Kit.

8- Secure the pulley you selected to the end of the transducer with the pulley's three set screws.





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### CALIBRATION

1- Press the MODE button until CALIBRATION appears. Press ENTER.

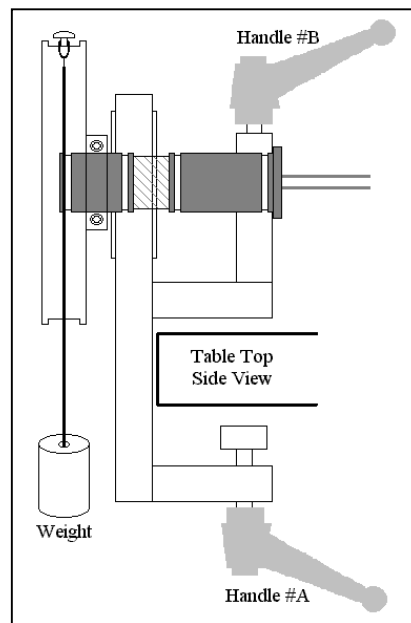
**Notes:** The 59K OHM GAIN value will appear. This parameter has been pre-entered from the transducer calibration record. It should only be altered if a new transducer has been installed into the unit. This value has to be exactly the same as the one on the "Fact Sheet" in this manual. Press SET only if you need to change this number. At the blinking cursor, enter the new value utilizing the numeric keypad. Press ENTER when you are finished or if you do not wish to change this number.

The 100% GAIN value will appear. Press SET if you need to change this number or ENTER if you do not. Pressing ENTER will advance to the CALIBRATION display. In this mode the transducer is directly connected to the display for continuous observation and calibration of the STH3 Torque Tester. Press ESC to leave this mode at any time.

2- Attach the wire to the pulley with the loop of the wire and the screw on the circumference of the pulley.

**Notes:** Wrap the wire around the pulley at least 90 degrees. If you wrap the wire to the right, you test the unit for applied; if over the left side, you test for release.

3- Hang the weight from the free end of the wire. Be very careful not to drop the weight. Hang it gently.



**Notes:** If the reading on the display is within the +/- 1% range (the radius of the pulley multiplied by the weight), the torque tester meets the calibration requirements. Press ESC to exit CALIBRATION. If your machine does not meet the above criteria, take the weight off and go back to the 100% GAIN adjustment menu. Do not change the 59K OHM value! If your reading was higher than the calibrating torque (the radius of the pulley multiplied by the weight), increase the 100% GAIN value; if lower, decrease the value. Enter the CALIBRATION menu by pressing ENTER, then hang your weight again. Check your reading. If you are still out of calibration, Repeat the above steps in this paragraph until you get the correct reading.