

MESURgauge Software



User's Guide



MARK-10



Thank you...

Thank you for purchasing MESURgauge software, a data collection and analysis program developed to:

■ **Measure**

Collect data from digital force gauges, torque gauges, and travel displays.

■ **Graph**

View a real time graph of load vs. time or travel.

■ **Analyze**

View an analysis graph, calculate statistics, and zoom to selected locations on the graph.

■ **Store**

Save results to a file, or export directly to Microsoft® Excel™. Save and recall previously saved test data, test setups and gauge configurations.

MESURgauge expands the functionality of a Mark-10 testing system, typically comprising a test stand, force gauge, grips, and accessories.

This User's Guide provides detailed operating instructions. For additional information or answers to your questions, please do not hesitate to contact us. Our technical support and engineering teams are eager to assist you.

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1 STARTUP

1.1 Computer Requirements

A personal computer running Microsoft® Windows 2000, XP or Vista operating system, with screen resolution of 1024 x 768 minimum, is required to run MESURgauge software. An RS-232C serial port ("COM" Port) is required to communicate with a gauge. A second COM port is needed to communicate with a digital travel display. A CD-ROM drive is needed for software installation.

1.2 Installation Instructions

Insert the MESURgauge installation CD into the computer's CD-ROM drive. If *AutoRun* is enabled on the computer, the setup program will run automatically. If not, the setup program may be run manually. Click the **START** button on the Windows task bar, select "Run...", type "D:Setup" in the dialog box and press **ENTER**.

Alternately, using *My Computer* or *Windows Explorer*, navigate to the CD-ROM drive and double-click the file "Setup.exe".

Follow the prompts on the screen to install MESURgauge.

1.3 Running MESURgauge Software

When the installation is complete, run MESURgauge by clicking the Windows **START** button, locating "MESURgauge by Mark-10" under "Programs", and then clicking "MESURgauge".

1.4 MENU ITEMS (available in all tabs)

File

Factory Defaults – Click to restore the factory default settings.

Close – Click to exit MESURgauge.

Help

Show Tip Strips – Check this box to show "tip strips" (also known as "tool tips"). These are text boxes that appear when the cursor hovers over an object or area of the



screen.

MESURgauge User's Guide – Click to open the user's guide PDF document. (Note: Adobe Reader is required and is downloadable at www.adobe.com).

Mark-10 Website – Click this to link to the Mark-10 website. (Note: An internet connection and a browser is required).

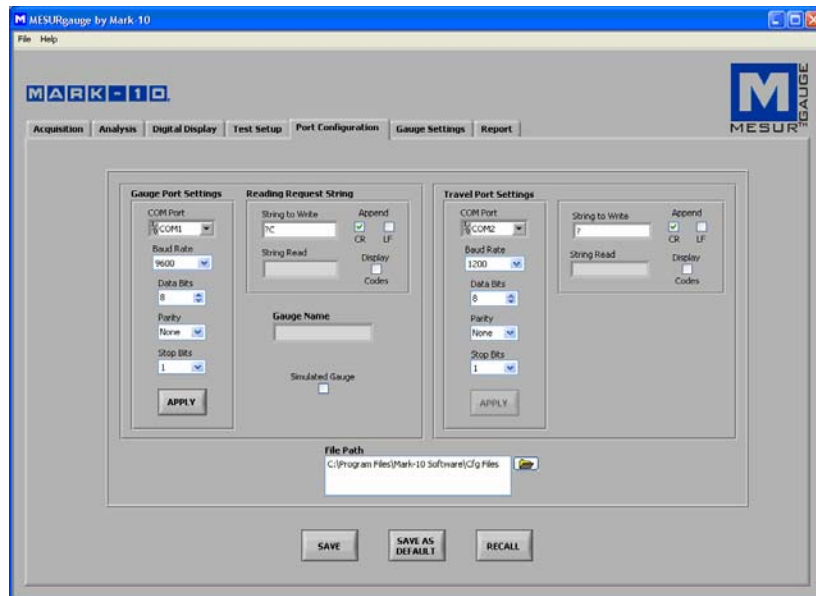


(About)

Click the MESURgauge logo to display general software information.

2 PORT CONFIGURATION TAB

Use this screen to configure the computer's COM port settings to which the instruments are connected. The default settings are the same as the factory default settings for Mark-10 gauges. The setting most likely to be changed is the particular COM port to which the instrument is connected.



2.1 Gauge Port Settings

COM Port

Select the COM port that the gauge is connected to from the drop-down list. Clicking **REFRESH** updates the list with all installed ports.

Baud Rate

Select the baud rate of the serial port. The default setting is 9600 baud.

Data Bits

Select the number of data bits for the serial port, then click the **APPLY** button below. The default setting is 8 data bits.

Parity

Select the parity setting of the serial port. The default setting is "None" (no parity).

Stop Bits

Select the number of stop bits for the serial port. The default setting is 1 stop bit.

APPLY

Click this button to apply changes to the above settings.

2.2 Reading Request String

String to Write

Enter the command string to request a reading from the instrument. The default string for Mark-10 gauges is "?C" (no quotes). Select either or both of the CR and LF check boxes to append the string as required. CR (default) or CR-LF may be used for Mark-10 gauges. The default string can be recalled by right-clicking in the box and selecting "Reinitialize to Default Value".

The ability to specify the request data command adds flexibility in testing. For example, peak or average readings may be read from the gauge. Additionally, it allows for the compatibility of MESURgauge with gauges not manufactured by Mark-10.

String Read

This is the raw character string read from the gauge.

Display Codes

Display control character '\ ' codes (\r = carriage return, \n = line feed, \s = space).

2.3 Gauge Name

Optionally enter a name to be associated with the gauge settings in this text box. This is helpful in identifying the particular gauge being used. This name is automatically entered in the file dialog box which opens when the **SAVE** configuration button is clicked. Any name may be used. For further information on saving, see the **SAVE** button description in Section 2.6.

2.3 Simulated Gauge

Check this box to simulate data being received from an instrument. No serial connection is needed to a gauge. To start collecting data, click the **Acquisition** tab and click the **START** button. Data will populate the graph and table at the specified rate. This is provided for demonstration purposes only.

2.4 Travel Port Settings

These settings apply to the second COM port. This COM port is intended for use with a serial port digital travel display which is attached to a test stand (travel measurement is used for tests such as spring and tensile testing). The information about the settings in Section 2.1 (Gauge Port Settings) also applies to this section.

2.5 File Path

Enter a full path or browse for a folder to use for Gauge Configuration (*.cfg) files. To browse for a folder, click the folder icon at the right of the text box and navigate to or create the desired folder, then click the "Current Folder" button in the dialog box.

2.6 Shared Buttons

SAVE

Click this button to open a file dialog box prompting to save the current settings to a configuration file (this file has a .cfg extension). Any file name may be entered and any folder may be selected or created.

SAVE AS DEFAULT

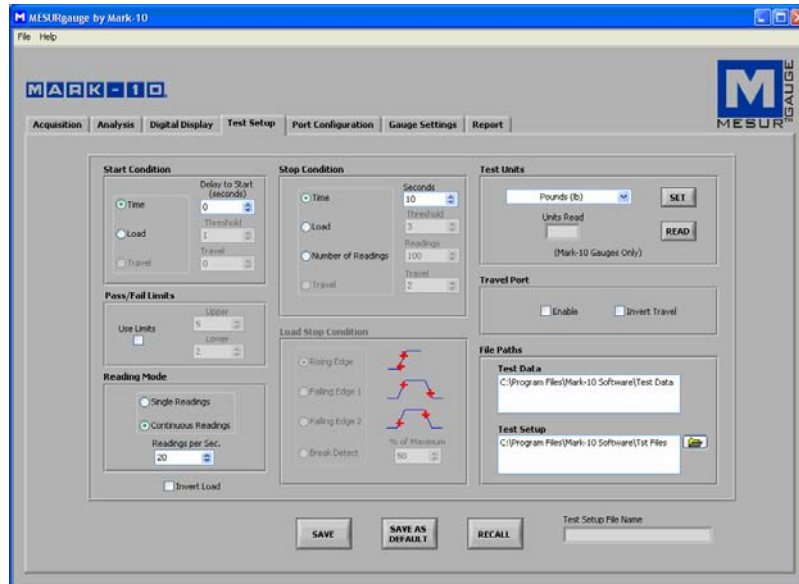
Clicking this button saves the current settings to the default configuration file "Default.cfg". (No file dialog box opens.)

RECALL

Click this button to open a dialog box in which to browse for previously saved configuration files. Parameter fields will be populated based on the information in the configuration file.

3 TEST SETUP TAB

Use this tab to configure various parameters for the test. This includes test start and stop conditions, pass/fail limits, selection of continuous or discrete readings, and data sampling rate.



3.1 Start Condition

Select an option button for time delay, load threshold, or travel to begin the test.

Time

Set time delay, in seconds, to begin the test.

Load

Set a load threshold to begin the test (The load units are as specified in the **Select Units** drop-down list box in the upper right area of this tab).

Travel

Set a travel threshold to begin the test. The second COM port must be enabled for this selection to be made (the travel units are as specified with the **Inches / Millimeter** option buttons in the right-center area of this tab).

3.2 Stop Condition

Select an option button for time, load, the number of readings, or travel to stop the test.

Time – Seconds

Set the duration of the test, in seconds.

Load – Threshold

Set the load threshold at which to terminate the test (the load units are as specified in the **Select Units** drop-down list box in the upper right area of this tab). See **Stop Threshold Options** below for various load stop threshold options.

Number of Readings – Readings

Set the number of readings at which to terminate the test.

Travel

Set the travel threshold to end the test. The second COM port must be enabled for this selection to be made (the travel units are as specified with the **Inches / Millimeter** option buttons in the right-center area of this tab).

3.3 Load Stop Condition

Four test stop options based on load threshold are available:

Rising Edge

Stop threshold is higher than the start threshold (increasing load).

Falling Edge 1

Stop threshold is lower than start threshold (decreasing load).

Falling Edge 2

Stop threshold is higher than Start threshold, but the load is decreasing.

Break Detect

Stop the test when the load decreases to a specified percentage of the maximum (peak) reading during the test.

3.4 Reading Mode

Single Readings

When this option is selected, single readings are taken from the gauge each time **READ** is clicked, or the **DATA** button on the gauge is pressed. This button appears below the graph in the **Acquisition** tab when this option is selected.

Continuous Readings

When selected, readings are taken from the gauge at a rate set in the *Readings per Second* field.

Readings per Second

This numeric box sets the number of readings per second that MESURgauge requests data from the gauge in the “Continuous Readings” mode. Available range is 0.001 to 50 readings per second.

3.5 Invert Load

Check this box to invert the polarity (sign) of the load reading. This is useful, for example, in tensile strength testing. Tension readings, which have a negative sign, can be reversed so that the graph shows increasing values instead of decreasing values.

Note: There is another instance of this check box in the Acquisition tab. Checking one box automatically checks the other.

3.6 Test Units

Note: Reading and setting units is possible with Mark-10 gauges only.

Select Units

The gauge’s unit of measurement can be set by clicking on the appropriate selection from the drop-down menu.

SET

Sets the gauge to the units of measurement selected.

READ

Reads the unit of measurement to which the gauge is currently set.

Units Read

Displays the unit of measurement to which the gauge is currently set.

3.7 Travel Port

This is a second COM port from which data from a travel display is received. Travel readings are tabulated and plotted vs. load, as opposed to time vs. load.

Enable

Check this box to enable the second COM port for travel data collection. The settings for this port can be configured in the **Port Configuration** tab.

Invert Travel

Check this box to invert the polarity (sign) of the readings from the travel display.

When the travel port is enabled, readings are taken at a maximum of 4 times per second, which is a limitation of travel displays supplied with Mark-10 test systems.

3.8 Pass / Fail Limits

Check this check box to enable high and low indicators for go / no go type testing. When checked, *Pass*, *Fail High*, and *Fail Low* indicators appear in the Acquisition tab, below the **STOP** button.

3.9 Shared Buttons

SAVE

Opens a file dialog box in which to save the current settings to a test setup file (.tst extension). Any file name may be entered and any folder may be selected or created.

SAVE AS DEFAULT

Clicking this button saves the current settings to the default test setup file, "Default.tst".

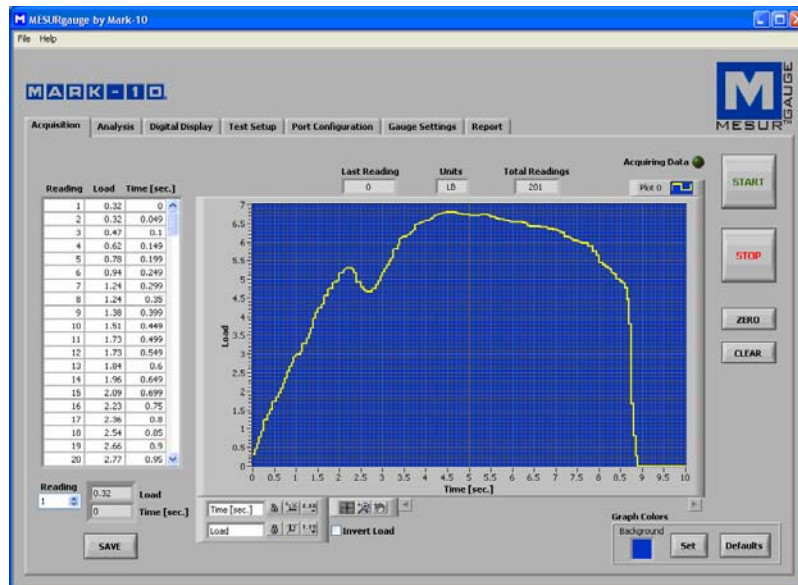
RECALL

Click this button to open a dialog box in which to browse for previously saved test setup files. Parameter fields will be

populated based on the information in the test setup file.

4 ACQUISITION TAB

Use this tab to view tabular and graphical data from a gauge as it is being received. When the **START** button is clicked, data received from the connected gauge(s) will be graphed and tabulated as they are being received. The test ends automatically when the stop condition in the **Test Setup** tab is met. The test can also be ended at any time by clicking the **STOP** button. Specific load and time (or travel) data points are displayed in the fields below the table.



4.1 START

Starts a test. Readings from the gauge are captured when the start condition in the **Test Setup** tab is met. When data is being captured, the "Acquiring Data" indicator above the **START** button turns on (bright green).

4.2 STOP

Stops a test. The test will stop automatically when the selected stop

condition in the **Test Setup** tab has been met. When the test is completed, the “Acquiring Data” indicator will turn off (dark green).

4.3 Table

Contains the reading number, load reading from the gauge, and relative time stamp (or travel datum) for each data point.

Scroll to, or manually enter, the desired reading in the *Reading* box to display corresponding load and time (or travel) data in the indicators to the right.

4.4 SAVE

Click this button to open a file dialog box in which to save the data from the table to a tab-delimited text file. Enter a file name and optionally browse to any desired folder location. The default file folder location for the test data files is set in the *Test Data Folder* box in the **Test Setup** tab. After saving, the file can then be opened by common Windows programs such as Notepad and Excel.

4.5 Last Reading

The most recent reading received from the gauge.

4.6 Total Readings

The total number of readings taken during the test.

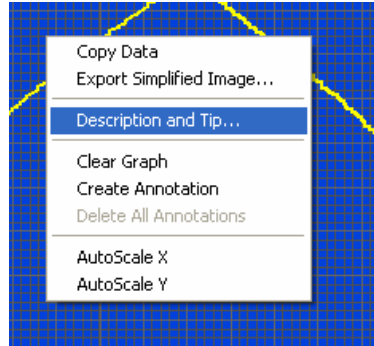
4.7 Units

The unit of measurement received with the data (the gauge[s] must be configured to send units information).

4.8 Graph

The graph plots load versus time or load versus travel (time is default). Scale minimum and maximum values can be set by double-clicking on the numerals long the X and Y axes. Change the numbers to the desired values and press ENTER or click away from the numbers.

Several options are available by right-clicking anywhere within the graph. A pop-up menu appears as follows:



The menu items are provided for quick access and convenience to some common functions. The AutoScale X and Y items are equivalent to the “padlock” icon on the scale palette at the lower right of the graph, described below.

4.9 Tools (under the graph)

View



Clicking on this button brings up the following six viewing options:

	Set a zoom window with adjustable x- and y-dimensions for a specific part of the graph
	Set a zoom window with adjustable x-dimension for a specific part of the graph
	Set a zoom window with adjustable y-dimension for a specific part of the graph
	View entire graph
	Zoom out
	Zoom in

Pan



This allows the user to reposition the graph. Click on the graph, move the mouse to the desired location, and release the mouse button.

4.10 X- & Y-scale Settings

Auto-scale lock



When in the locked position, the scale is in auto-scale mode.

Auto-scale



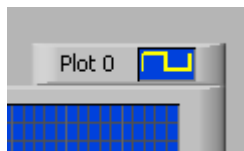
Click to auto-scale the axis.

Scale & grid properties

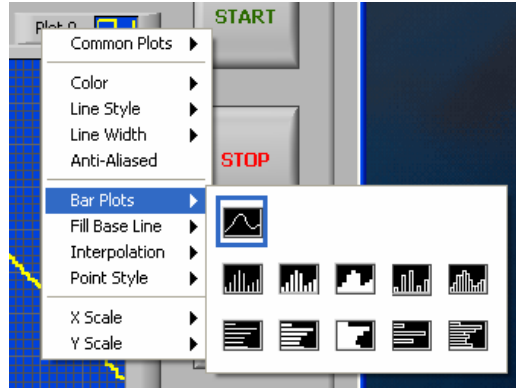


Click to adjust various scale and grid properties. A pop-up context menu provides access to these properties.

4.11 Plot Palette (upper right corner of the graph)

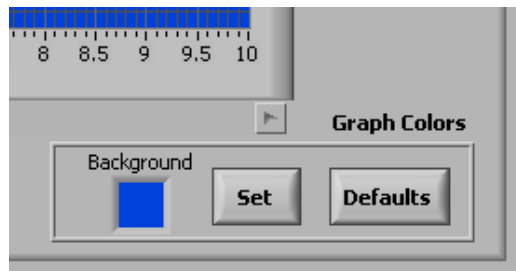


Several plot options are available by clicking on the Plot Palette icon. A menu of options will appear as follows:



Plot settings and graph properties can be configured as desired.

4.12 Graph Colors



Background Color Picker Box

Select the background color of the graph.

Set

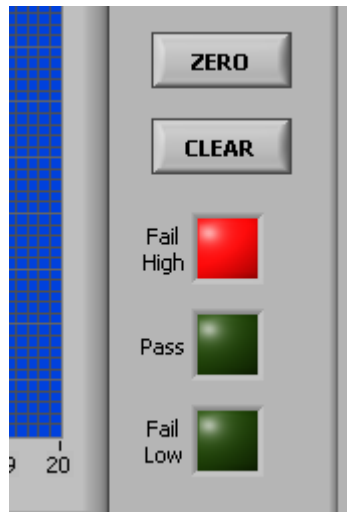
Sets the graph to the selected background color.

Defaults

Restores the background, plot, and grid colors to factory defaults.

4.13 Pass/Fail Indicators

When the *Use Limits* check box in the *Pass/Fail Limits* frame in the **Test Setup** tab is checked, the Pass/Fail indicators, shown below, become visible. While acquiring data, the load values received are compared to the upper and lower limits set in the Test Setup tab, and the appropriate indicator illuminates. A fail condition is represented by a bright red indicator. A pass condition is represented by indicated by a bright green indicator.



4.14 Invert Load

See Section 3.5.

4.15 Invert Travel

This checkbox is not visible unless the travel port is enabled in the Test Setup tab. For details see Section 3.7.

4.16 CLEAR

Sends a command to a Mark-10 gauge to clear peaks and start a

new average or external trigger test (if so enabled).

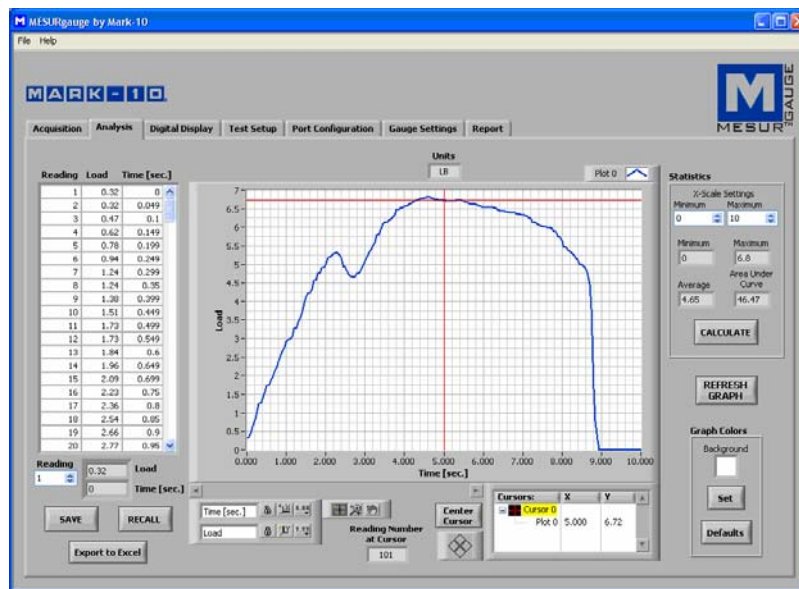
4.17 ZERO

Sends a command to a Mark-10 gauge to zero the display and perform the **CLEAR** function, as described above.

The **ZERO** and **CLEAR** buttons in MESURgauge perform the same functions as the **ZERO** and **CLEAR** buttons on Mark-10 gauges.

5 ANALYSIS TAB

This tab is used to analyze the data obtained during a test. Statistics are calculated and displayed automatically upon completion of the test. The graph cursor tools can be used to zoom to a specific area of the graph. Statistics may then be calculated for that region of the graph. Graph and table data from the *Acquisition* tab is automatically transferred to this graph and table when the test has been completed.



5.1 Graph

Graph functionality and tools are the same as in the **Acquisition**

tab, with one additional active icon:

Cursor Movement Tool

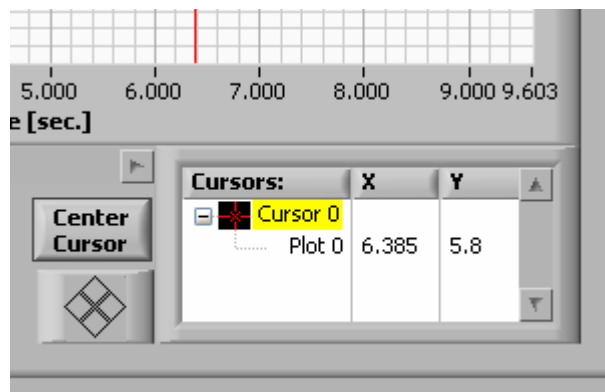


Clicking this button allows the X-Y cursor to be dragged to the desired position.

5.2 REFRESH GRAPH

Redraws the graph based on the data collected during the test.

5.3 Cursor Palette



Center Cursor

Centers the cursor in the graph area.

Cursor Control



Click on the quadrants of this icon to move the cursor in the corresponding direction.

Cursor Table

Displays the cursor position's X and Y values.

Reading Number at Cursor

Reading number corresponding to the current position of

the cursor.

5.4 Graph Colors

The graph color selection functionality is the same as described in the Acquisition tab.

5.5 Statistics

This frame displays statistical data for the test.

Maximum

The maximum load reading measured during the test.

Minimum

The minimum load reading measured during the test.

Average

The average (mean) of the readings. Note that in situations where load fluctuates between positive and negative values, this function considers the signs of the numbers, not the absolute values. (For example, the average of +5 and -5 is calculated as 0).

Area Under Curve

The average of the **absolute** values of the load readings multiplied by the selected time interval.

The above statistics are based on the data range specified in the X-scale Settings frame. This range defaults to the full range at completion of the test. This range can be modified by entering the desired range in the Minimum and Maximum numeric boxes. Click the **CALCULATE** button to calculate the statistics for the specified range. The graph will automatically adjust to reflect the new range.

5.6 Table

The table functionality is the same as described in the **Acquisition** tab.

5.7 RECALL

Opens a file dialog box prompting to recall a previously saved test

data file. The table and graph will be populated with the previously saved data, and the statistics will automatically be calculated.

Note: When recalling a test which used the travel port for travel measurement, or single readings, those options must be selected in the **Test Setup** tab in order for the x-axis label of the graph and the statistics to be displayed correctly.

5.8 SAVE

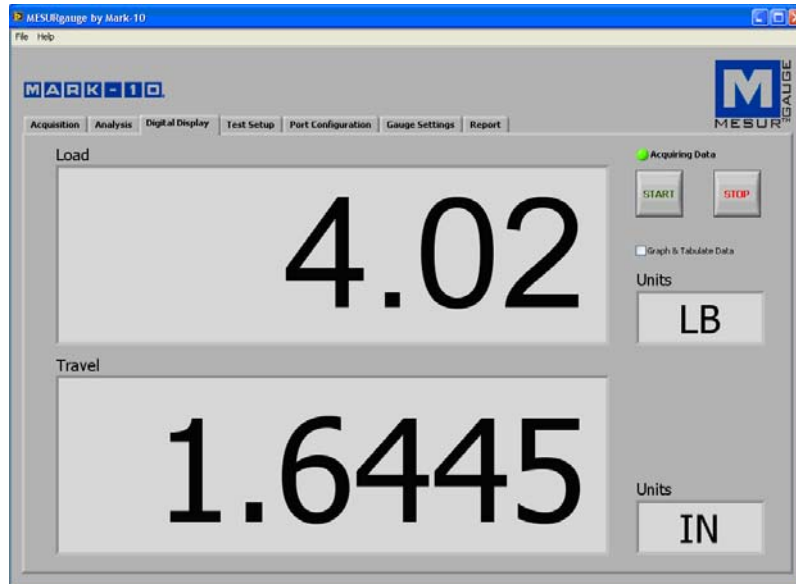
Opens a file dialog box prompting to save the data from the table to a tab-delimited text file. Enter a file name and optionally browse to any desired folder location. The default file folder location for the test data files is set in the **Test Data Folder** box in the **Test Setup** tab. After saving, the file can then be opened by common Windows programs such as Notepad and Excel.

5.9 Export to Excel

Clicking this button launches Microsoft® Excel™ (if installed, sold separately) and exports the reading numbers, load, and time directly into a worksheet.

6 DIGITAL DISPLAY TAB

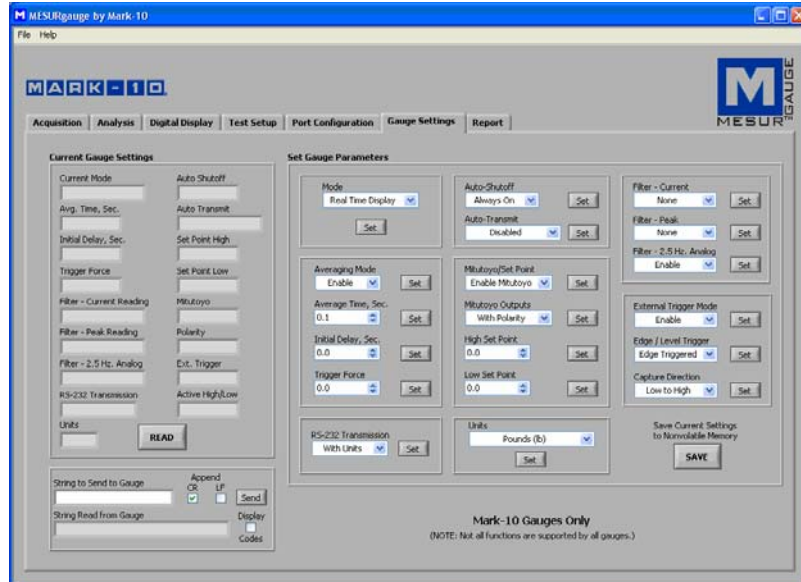
This tab is provided to display real time load readings (and, if the travel port is enabled, travel readings) in large numerals. If the "Graph and Tabulate Data" check box is checked, the graph and table in the Acquisition tab is populated. See image on the next page.



7 GAUGE SETTINGS TAB

This tab provides a convenient utility with which to read and set gauge configuration parameters from a PC. Settings are applicable only for Mark-10 gauges. Refer to your instrument's user's guide for details on the various parameters.

In the lower left-hand part of the screen, it is possible to enter commands to send to any gauge via the primary serial port. This facility allows the user to communicate with any gauge.



7.1 READ

Populates the fields above with current settings from a Mark-10 gauge.

7.2 SAVE

Saves the current gauge settings to the gauge's non-volatile memory. These will be the default settings when the gauge powers on.

Note: The desired settings must be individually written to the gauge (by clicking the **Set** button adjacent to the parameter menu) before clicking **SAVE**. It is recommended to click the **READ** button to confirm the current settings before clicking **SAVE**.

7.3 Set Buttons (all)

Click to set the Mark-10 gauge with the parameter selected from the drop-down menu adjacent to the respective **Set** button.

7.4 String to Send to Gauge

Enter a command to send to the gauge via the primary serial port. This facility allows the user to communicate with and send commands to any gauge. Click **Send** to send the command.

7.5 String Read from Gauge

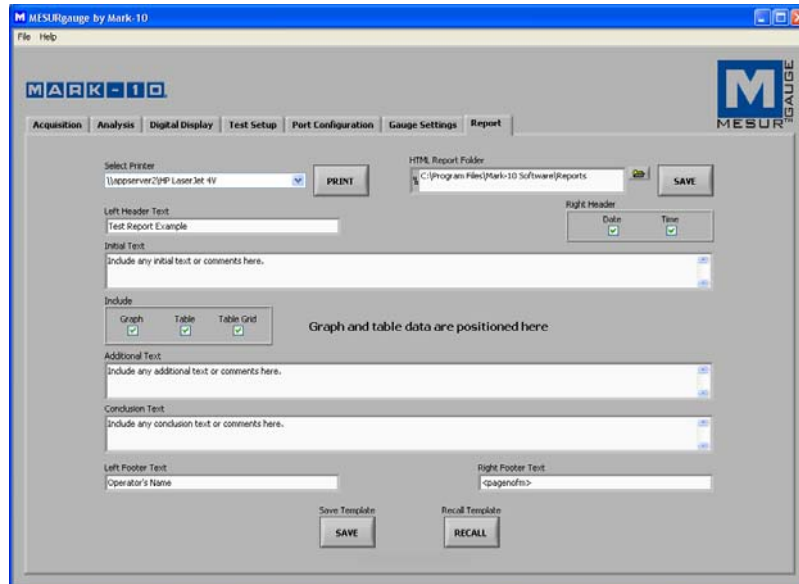
This text box shows the response string, if any, that is received in response to the above command.

7.6 Display Codes

Display control character '\ ' codes (\r = carriage return, \n = line feed, \s = space).

8 REPORT TAB

Use this tab to set up a report for the test. The report may be printed to the selected printer or saved as an HTML file. A report template may be saved and recalled.



The screenshot shows the 'Report' tab in the MESURgauge software. The window title is 'MESURgauge by Mark-10'. The interface includes a menu bar with 'File' and 'Help'. Below the menu bar is the 'MARK-10' logo and the 'MESUR GAUGE' logo. The main area contains several sections for configuring a report template:

- Select Printer:** A dropdown menu showing 'L:\apps\server2\HP Laser Jet 4V' and a 'PRINT' button.
- HTML Report Folder:** A text box containing 'C:\Program Files\Mark-10 Software\reports' and a 'SAVE' button.
- Left Header Text:** A text box containing 'Test Report Example'.
- Right Header:** Two checkboxes labeled 'Date' and 'Time', both of which are checked.
- Initial Text:** A text box with the instruction 'Include any initial text or comments here.' and a 'GO' button.
- Include:** Three checkboxes labeled 'Graph', 'Table', and 'Table Grid', all of which are checked. Below them is the text 'Graph and table data are positioned here'.
- Additional Text:** A text box with the instruction 'Include any additional text or comments here.' and a 'GO' button.
- Conclusion Text:** A text box with the instruction 'Include any conclusion text or comments here.' and a 'GO' button.
- Left Footer Text:** A text box containing 'Operator's Name'.
- Right Footer Text:** A text box containing '<pagenofm>'.
- Buttons:** 'Save Template' (with a 'SAVE' button) and 'Recall Template' (with a 'RECALL' button') are located at the bottom.

8.1 Select Printer

Select the printer to which the report will print. The Windows default printer is selected initially.

8.2 PRINT

Prints the report on the selected printer.

8.3 HTML Report Folder

Enter or browse for a folder in which to save the report files.

8.4 SAVE

Opens a file dialog box prompting to save the report. Enter a file name and optionally browse to any desired folder location. The default file folder location for report files is set in **HTML Report Folder**, as described above.

8.5 Left Header Text

Enter text to appear in the upper left corner of the report. The text will appear as **bold** in the report.

8.6 Right Header Check Boxes

Check the Date and/or Time boxes to include the current date and/or time in the right header of the report. Date and time will appear as **bold** in the report.

8.7 Initial Text

Enter any initial text here.

8.8 Additional Text

Enter any additional text here.

8.9 Conclusion Text

Enter any concluding text here.

8.10 Left Footer Text

Enter text to appear in the lower left corner of the report. The text will appear as **bold** in the report.

8.11 Right Footer Text

Enter text to appear in the lower left corner of the report. The text will appear as **bold** in the report.

Use the above text boxes to enter information and comments pertaining to the test. This information can be saved to a file as a template and can be recalled.

8.12 Include Graph

Check this check box to include an image of the graph in the report.

8.13 Include Table

Check this check box to include the table data in the report.

8.14 Include Table Grid

Check this check box to include a grid for the table.

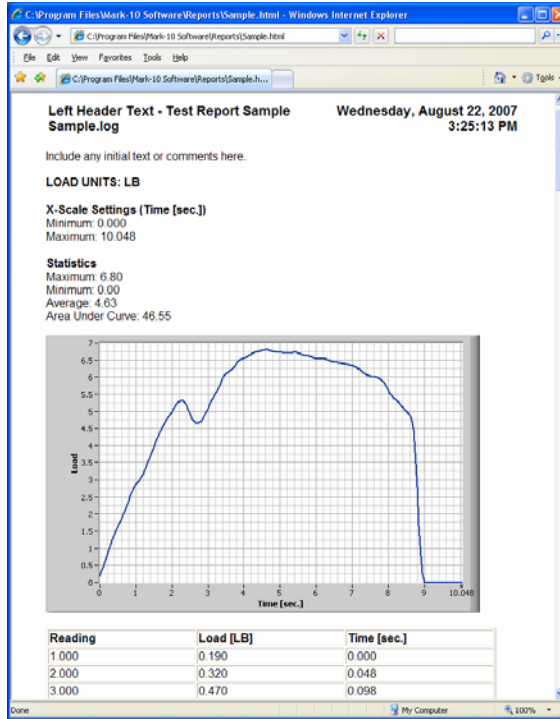
8.15 Save Template

Saves a template of all the information in the text boxes and selected settings to a file for recall.

8.16 Recall Template

Recalls a previously saved template.

A sample HTML report is shown below as it would appear in a browser:





Mark-10 Corporation has been an innovator in the force and torque measurement fields since 1979. We strive to achieve 100% customer satisfaction through excellence in product design, manufacturing and customer support. In addition to our standard line of products we can provide modifications and custom designs for OEM applications. Our engineering team is eager to satisfy any special requirements. Please contact us for further information or suggestions for improvement.

MARK-10

We make a measurable difference in force and torque measurement

