MTG-99 Hall Effect Gage

Ver: 1.1

Danatronics, Corp.

Liability

Ultrasonic testing is a function of using the proper equipment (electronics, transducer, cable and couplant combination) for the inspection and a qualified operator who knows how to use this manual, the instruments and all calibration procedures. The improper use of this equipment, along with the improper calibration can cause serious damage to components, factories, facilities, personal injury, and even death. ALL DANATRONICS GAGES ARE NOT INTRINSICALLY SAFE AND SHOULD NOT BE USED IN ANY HAZEDOUS OR EXPLOSIVE AREAS.

It is understood that the operator of this equipment is a well trained inspector qualified by either their own company or another outside agency per your internal Quality Control Procedures. Danatronics, Corp. and any of its employees or representatives shall not be held responsible for improper use of this equipment for its intended use.

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About the MTG-99 Series

The MTG-99 is designed for simple and easy non-destructive thickness measurements of any non-ferrous material, less than .360" (9.144 mm) with access to both sides. Each surface should be flat and parallel. Included in your kit should be the MTG-99 along with the AC charger adapter, USB cable, internal re-chargeable Li Ion battery, Custom rubber booth with stand, internal datalogger with 2 gb micro sd card memory, Probe along with the calibration kit and shims.

Latest Software Updates

Danatronics periodically releases software updates with new and improved gage functionality and features. You can download the latest standard software at no charge by going to www.danatronics.com and clicking on the support tab. Use the most recent version of Data XL, which is also available on the website to download at no charge, and use the USB cable provided with the kit. Plug the cable into the USB port on the top left of the MTG-99 and use the "Software Upgrade" tab to begin.

1 Basic Gage Features

Keypad Functions

The figure below shows the full keypad layout representative of the MTG-99 Hall Effect thickness gage.

The following table refers to each key or symbol shown on the keypad. Note the F keys correspond to text above each key and prompts change depending on which screen you are adjusting.

Key	Function
▲	Up arrow key
▼	Down arrow key
◄	Left arrow key
►	Right arrow key
⏻	On/Off symbol (under the F1 key)

F1, F2, F3 and F4, these keys are called soft keys and correspond to text above the keys while making adjustments in various screens.

At the top of the unit is the probe connection, on the top right, mini usb and optional footswitch or rs232. Also available as a hardware option is internal Bluetooth to communicate via Bluetooth (requires separate receive device).

Function Keys

Function keys, or F keys (e.g., F1, F2, F3, F4), have various gage functions and may change depending on the display screen. View the bottom of the display screen for the function that corresponds with the appropriate F key. For example, F1 may correspond with the Save Thickness function, F2 with the Freeze function, or F3 with the Clear MNMX (clear min/max) function. Many times the left or right arrow keys can be used instead of the MENU/OK key to highlight a parameter or to see what is under the selected choice.

Battery Pack

To ensure the highest level of performance and protection, the battery compartment is separated from the electronic components of the gage.

Monitoring the Battery Charge from the Display Screen

The MTG-99 continuously displays the percentage of battery life remaining on the bottom right corner of the measurement display screen. When the battery life is below 10%, the battery indicator will turn from green to red. When the battery life is below 5%, the indicator will flash.

Note: Power off the MTG-99 series gage to ensure any saved data is stored internally.

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Re-charging the Battery

To re-charge the battery, simply plug in the charger to an AC outlet (between 100-240V) and plug the other end into the USB connector on the top of MTG-99 gage. The **F4** key will light up with a blue LED when charging, and the light will go out when fully charged. Allow several hours (up to 10 hours) to fully charge.

Note: There is a battery indication monitor on the bottom right of the screen showing the percent of battery life, as seen below at 75%.
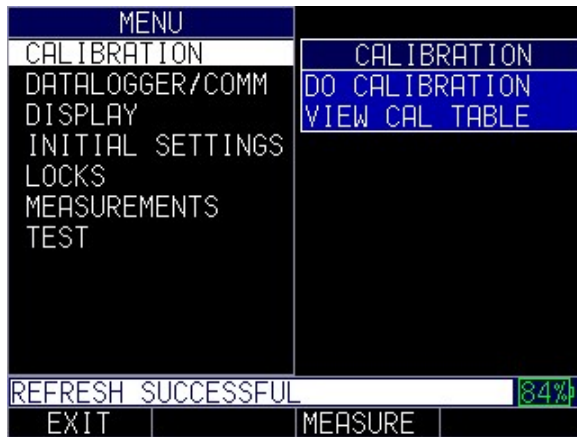
You may also use a computer instead of the wall charger to charge the gage, but this will take significantly more time than using an AC outlet. If you decide to charge the gage

using this method, make sure the gage is powered off before you connect the USB to the computer and to the gage itself.

When charging is complete, the **F4** key will appear translucent in color. Power off the gage, and unplug the charger from the USB connector on the top of the gage.

Using Non-rechargeable AA Batteries

A non-rechargeable alkaline AA pack is also available. This option requires a spare tray and 3 AA batteries. Follow these steps to insert non-rechargeable batteries:

1. Un-screw the battery door.
2. Disconnect the Li-Ion battery connector.
3. Plug in the AA tray connector.
4. Replace the battery door and tighten screws.

Note: When using the 3 AA battery tray, batteries cannot be re-charged.

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Boot, Bail, and Strap Features

The custom rubber boot with built in bail and 4-point chest harness is an accessory for the MTG-99 gages. Not only does the boot help to protect the gage from the elements, but the functional bail and strap also offers a variety of positioning options.

Placing the Boot on the Gage

To insert the gage into the rubber boot, follow these steps:

1. Guide the gage strap through the hole at the top of the boot (either right or left side).
2. Slide the gage into the top of the boot.
3. Gently apply pressure to the bottom of the gage until it fully pops into the boot.

Removing the Boot from the Gage

Be sure that the bail is set in the open position before attempting to remove the boot. Follow these steps:

1. Apply pressure to the bottom two corners of the boot until the gage pops out.
2. Wriggle the top section of the gage out of the boot.
3. Guide the gage strap through the hole at the top of the boot.

Using the Boot Strap and Bail

The boot strap is attached to the bail on the back of the boot. It can be used as a right- or left-handed strap, or a finger strap. You can also connect the strap to a 4-point chest harness for hands-free use.

The bail, including the straps, can be removed from the boot. This is useful when adding accessories or locating the gage's serial number. Simply open the bail and apply gentle pressure to one side of the connector, which is located at the top of the bail. The piece will pop off exposing the accessory mount (see below) and gage serial number.

Other Gage Features

Locating the USB Slot

MTG-99 gages are furnished with a USB 2.0 slot on the top of the gage. Use the USB slot to connect AC chargers or to connect to a computer for cross-functionality.

Using the Accessory Mount

On the back of the gage is a ¼ x 20 accessory mount. This connector point is compatible with a multitude of accessories including a magnetic pipe attachment and a Gorilla Pod.

Locating the Altitude Change Release Regulator

At the bottom of the gage is a circular outline with small holes. This feature regulates pressure due to altitude change. Any pressure built up inside the gage will be automatically released.

2 Using Basic Gage Operations

Power on the Gage

To power on any of the MTG-99 gages, follow these steps:

1. Press and hold the **F1** key for more than 3 seconds. The power symbol, as shown below, is under the **F1** key printed on the keypad.

Power symbol
under the F1 key

2. The following screen will appear on the gage display. The MTG-99 requires 15 minutes for the probe and gage to warm up as their temperature aligns. To skip this screen press **F1** to go to the measurement screen or **MENU/OK** to go to the *Main menu*
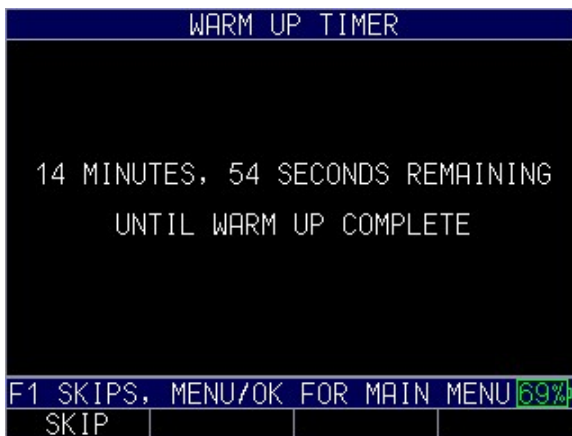
> **Note:** Temperature plays an important roll in Hall Effect thickness gaging. It is important to make sure the probe and gage warm up in the environment they will be used in prior to calibrating and making measurements

Selecting the Menu Option

The gage offers several **Menu** options as shown below:

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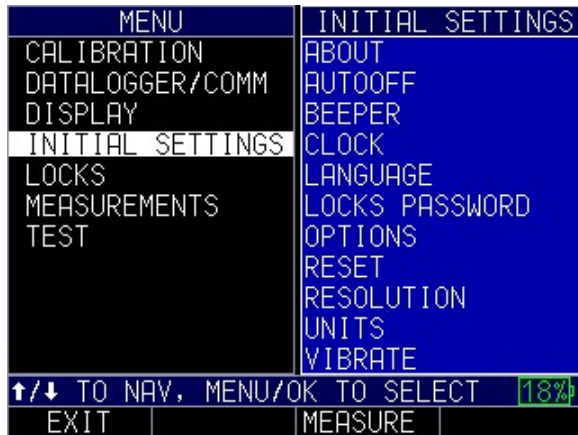
Use the up/down and left/right arrow keys to navigate around the menu. For a full description of all the **Menu** options, refer to sections 3-8

Performing a Reset

You can reset the gage parameters back to the default settings by performing a gage reset.

> **Note:** Performing a reset permanently deletes all of the saved parameters from the gage and replaces the settings with default values.

Parameter Reset

Performing a Parameter Reset restores default parameters to the factory settings. To perform a Parameter Reset, follow these steps:

To perform a parameter reset, follow these steps:

1. Press **Menu/OK** to enter the *Main Menu*.
2. Use the up and down arrow keys to select **Initial Settings**.
3. Press the **MENU/OK** key.
4. Use the up and down arrow keys to select **Reset**.
5. Press the MENU/OK key
6. The *Reset* screen will then appear

```
              RESET
          DATABASE
          PARAMETERS
          ALL ABOVE




REFRESH SUCCESSFUL        85%
    BACK            ABOUT
```

7. Select the **Parameters** option, and press the **MENU/OK** key. The following screen appears:

```
              RESET


        RESTORE DEFAULT
           PARAMETERS
         ARE YOU SURE?




                          75%
   BACK     YES      NO
```

8. Press the **F2 – Yes** key to reset all parameters in the gage back to default settings, or press the **F3 – No** key to cancel a parameter reset.

Database Reset

Performing a Database Reset clears all the files in the database and keeps the first three: Linear, Row Increment and Col Increment database files with cleared readings. All of the user created files in the database will be cleared and deleted. To perform a Database Reset, follow these steps:

To perform a **Database** reset, follow these steps:

1. Press **Menu/OK** to enter the *Main Menu*.
2. Use the up and down arrow keys to select **Initial Settings**.
3. Press the **MENU/OK** key.
4. Use the up and down arrow keys to select **Reset**.
5. Press the MENU/OK key
6. The *Reset* screen will then appear

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```
            RESET
          DATABASE
          PARAMETERS
          ALL ABOVE




REFRESH SUCCESSFUL        85%
     BACK              ABOUT
```

7. Select the **Database** option, and press the **MENU/OK** key. The following screen appears:

```
            RESET


         RESTORE DEFAULT
           PARAMETERS
         ARE YOU SURE?




                           75%
     BACK      YES      NO
```

8. Press the **F2 – Yes** key to reset the database in the gage, or press the **F3 – No** key to cancel a parameter reset.

Database/Parameter Reset

Performing a Database/Parameter Reset clears all the files in the database and keeps the first three Linear, Row Increment and Col Increment database files with cleared readings. All of the user created files in the database will be deleted and the default parameters will be restored at the same time. This selection is the equivalent of performing MASTER RESET on the instrument, restoring original factory setting. To perform a Database/Parameter Reset, follow these steps:

1. Press **Menu/OK** to enter the *Main Menu*
2. Use the up and down arrow keys to select **Initial Settings.**
3. Press the **MENU/OK** key.
4. Use the up and down arrow keys to select **Reset.**
5. Press the **MENU/OK** key to bring up the *reset* screen

```
            RESET
         DATABASE
         PARAMETERS
         ALL ABOVE




REFRESH SUCCESSFUL        85%
    BACK          ABOUT
```

6. Use the up and down arrow keys to select **Database/Parameter**
7. You will be asked if you're sure you want to reset your settings. Press the **F2 - Yes** key to reset the database/parameters in the gage back to default settings, or press the **F3 – No** key to cancel a database/parameter reset.

```
            RESET


       RESTORE DEFAULT
         PARAMETERS
        ARE YOU SURE?



                         75%
  BACK    YES     NO
```

About Screen

You can find out information about your MTG-99 gage, such as the model number, version number, and contact information from the gage's *About* screen.

To go to the *About* Screen, follow these steps:

1. Press **Menu/OK** to enter the *Main Menu*.
2. Use the up and down arrow keys to select **Initial Settings**.
3. Press the **MENU/OK** key.
4. Use the up and down arrow keys to select **About**.
5. Press the MENU/OK key to go to the about screen

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3 Getting Started

> **Note:** It is very important to turn on the instrument and let it warm up for 15 minutes at the temperature at which the unit is to be calibrated and also testing parts. It is also very important that the temperature at the time of readings is stable. Otherwise, thermal drift can occur and the need to Q-cal more often will be required.

Preparing the Gage and Probe

To begin, follow these steps:

1. Connect the two pieces of the probe stand and attach the coiled cable to the base of the probe. Once the cable is attached to the probe, the probe can be inserted into the stand. Use the white screw to secure the probe in place and attach the end of the coiled cable to the top right of the MTG-99.
2. Connect the probe to the MTG-99 gage with the coiled cable via the connector on top of the MTG-99
3. Press and hold the **F1 - ON** key to turn on the MTG-99. Pressing and holding the F1 key also turns the gage off
4. Check the % battery life in the bottom right hand corner. If low, connect the USB cable and charger to your MTG-99 using the USB port. The F4 key will light up blue when charging and shut off when done charging

We recommend you allow your MTG-99 and probe (with nothing attached, ie a shim) to warm up for 15 minutes in the same environment the inspection will be completed in. This will allow the unit to reach equilibrium at this temperature. It is important to keep the temperature constant; small changes in the probe temperature can affect the reading and desired accuracy. If you are not able to wait 15 minutes, you can press the F1 key for

SKIP and the MTG-99 will go into measurement mode. Note: If skip is pressed calibrations may be less accurate and the operator may need to Q-Cal (with ball and shim removed from probe) at a more regular basis.

```
┌────────────────────────────────────────┐
│           WARM UP TIMER                 │
│                                         │
│                                         │
│                                         │
│   14 MINUTES, 54 SECONDS REMAINING      │
│       UNTIL WARM UP COMPLETE            │
│                                         │
│                                         │
│                                         │
│                                         │
│ F1 SKIPS, MENU/OK FOR MAIN MENU 69%     │
│     SKIP    │       │        │          │
└────────────────────────────────────────┘
```
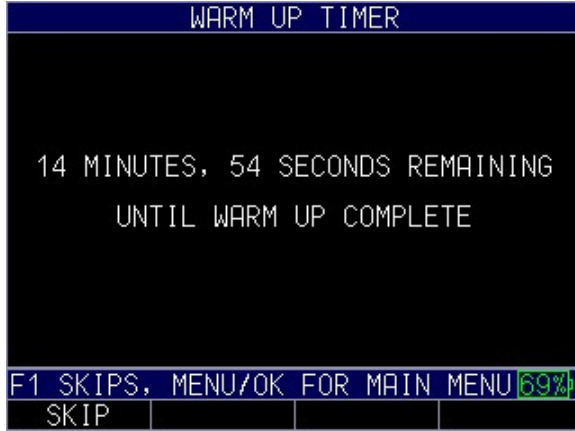
On power up, the default unit type is inches; the resolution is set to auto which will change from .001" to .0001" based on thickness range, and the display rate is set to 2 Hz. These parameters can be changed within the *Main Menu* and are explained in more detail in this manual. If the test piece is greater than .160" the unit will display in 3 digit resolution in inches or 2 digits in mm. Units and resolution settings are found in the initial settings menu; display rate is found under the measurement meu.

Selecting Ball Size

When selecting the ball size, "3/16" (0.360 MAX) is the default selection.   You may need to change this based on your application.   It is recommended you use the largest target ball size available for your thickness range.

Note: The target ball size used to calibrate the MTG-99 must be used for all readings until the gage is calibrated to another target ball size.

The MTG 99 offers an expanded list of target options to greatly extend its measurement capability.

Targets	Min Thickness	Max Thickness	Accuracy	
PR-1			**Basic Calibration**	**Multipoint**
1/16 in. (1.58 mm) ball (TB-062)	0.0001 in. (0.001 mm)	0.080 in. (2.03 mm)	4%	3%
1/8 in. (3.17 mm) ball (TB-125)	0.0001 in. (0.001 mm)	0.240 in. (6.1 mm)	4%	2%
3/16 in. (4.76 mm) ball (TB-187)	0.0001 in. (0.001 mm)	0.360 in. (9.1 mm)	3%	1%

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To set the ball size on the MTG-99, follow these steps:

1. Press the **Menu OK** key to access the Main Menu
2. Scroll down to Measurements then press **Menu Ok** to select
3. In the Measurements Menu scroll down to ball size and use the **right arrow** to toggle to the right size of the screen where the ball size is listed
4. Use the up and down arrows to highlight the desired ball size and press Menu Ok to select.
5. Press **F3** to go to the measurement screen or **F1** to go back to the main menu

```
                MEASUREMENTS
  ALARM TYPE       OFF
  AVERAGE          ON
  DIFF TYPE        OFF
  DISPLAY RATE     1 HZ
  MIN/MAX          MIN&MAX
  STRIP CHART      OFF
  BALL SIZE        1/16 (0.080 MAX)
                  •1/8  (0.240 MAX)
                   3/16 (0.360 MAX)
                   1/4  (0.360 MAX)

  REFRESH SUCCESSFUL              69%
      BACK          MEASURE
```
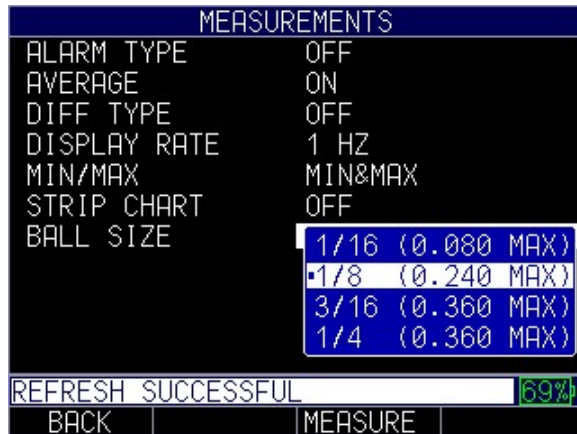
Note: The number in parenthesis is the maximum thickness for a given ball size.   Shim sizes may be slightly larger than the max value ie 0.241" vs 0.240"

3 Calibrating the Gage

The standard multipoint calibration should be completed every time the gage is being used.   It should be done after waiting 15 minutes for the gage and probe to warm up in the environment in which they will be used.   On thicker parts or if temperature changes by more than 1-2 degrees F it is recommended to perform a Q-Cal. Q-Cal is used for offset calibration during the measurement process to realign the calibration. We recommend performing a Q-Cal every 15 minutes while the gage is in use.

Note: It is strongly recommended to do a Q-CAL every 15 minutes, particularly on parts thicker than .080" or 2mm. The MTG 99 will detect temperature changes which will lead to errors and prompt the user to press Q-cal either on the unit above F4 or on the side of the probe.

View CAL Table

Throughout the calibration process or while making measurements, you may need to reference the **CAL Table**.

To view the current calibration table, follow these steps:

1. Press the **MENU/OK** key to access the **Main Menu**.
2. Use the up and down arrow keys to select the **Calibration** option.
3. Press the **MENU/OK** key.
4. Use the up and down arrow keys to select the **VIEW CAL TABLE** option.

```
       CALIBRATION
 DO CALIBRATION
 VIEW CAL TABLE




 ↑/↓ TO NAV, MENU/OK TO SELECT  71%
     BACK           MEASURE
```

5. Press the **MENU/OK** key to view the calibration table.

```
          CALIBRATION
 POINT TABLE          P1   1/8
     0.0109
     0.0198          ┌──────────┐
     0.0395          │          │IN
     0.0787          └──────────┘
     0.1550
     0.2400



                              72%
     BACK           MEASURE
```
Calibration Table

Standard Calibration

The standard calibration process involves using the included calibration kit to take readings with no ball, with the ball on sleeve and with at least two calibration points representing the high and low values of your range.   It is recommended that you use all available calibration points within the range you will be measuring to ensure the greatest accuracy

Proper alignment of the target ball to the tip of the probe is critical for accurate readings. Examples of good and poor ball alignment relative to the tip of the probe are shown below and should occur only after the power up warm up time has been done and a proper multi-point calibration performed

> **Note:** Proper alignment of the target ball to the tip of the probe is critical for accurate readings.

> **Note:** The target ball size used to calibrate the MTG-99 must be used for all readings until the gage is calibrated to another target ball size.

To begin the standard calibration, follow these steps:

1. Connect the probe to the coiled cable and attach to the gage prior to turning on the gage
2. Power on the gage
3. Wait 15 minutes for the gage and probe to warm up following the timer on the screen.


```
               WARM UP TIMER



       14 MINUTES, 54 SECONDS REMAINING
            UNTIL WARM UP COMPLETE




F1 SKIPS, MENU/OK FOR MAIN MENU 69%
   SKIP
```
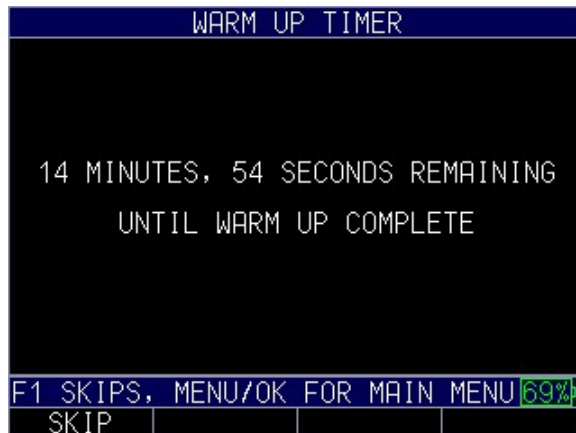
4. Press the **MENU/OK** key to access the **Main Menu**.
5. Use the up and down arrow keys to select the **Calibration** option.
6. Press the **MENU/OK** key.
7. Use the up and down arrow keys to select the **Do Calibration** option.

8. Press the **MENU/OK** key to go to the *calibration* screen.

The bottom of the calibration screen provides guided instructions to complete the calibration process. You will make readings with nothing on the probe, with the ball on fixture and with the standard calibration shim in their respective fixtures.

Note: The target ball should be placed on calibration fixtures prior to placing the fixture on the probe to avoid damaging the probe

To complete the standard calibration process, follow the prompts on the screen as shown:

1. Ensuring there is nothing on the probe and no fixtures are near the tip, Press **F4** (CAL) to calibrate

2. Place the target ball on it's respective ball on calibration fixture and place the fixture securely on the probe.

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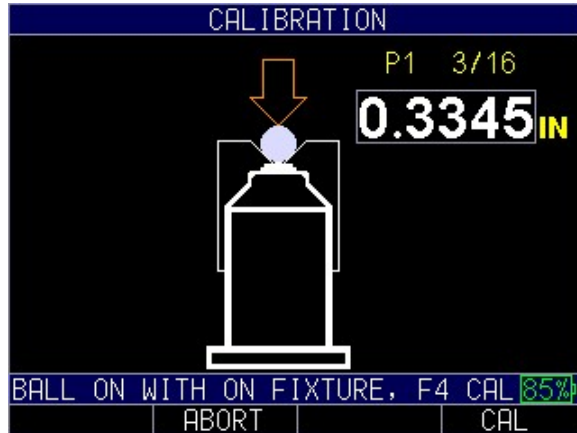
3. Press **F4 – CAL** to calibrate
4. The gage will now prompt you to use the calibration fixtures with shims. beginning with the thinnest calibration point . Place the ball in on the calibration fixture with the thinnest shim for your intended measurement range and place the fixture on the probe.
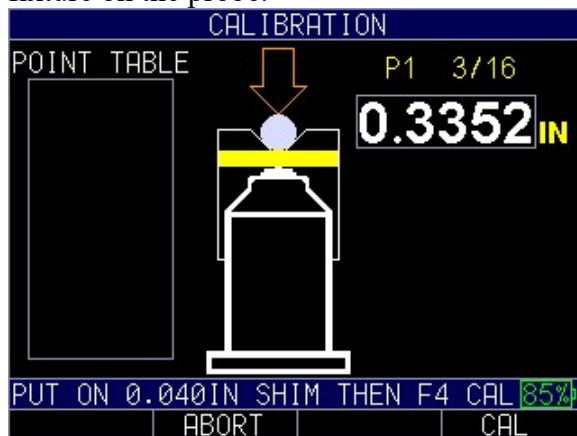
Note: While the gage will prompt you to use specific values, you can measure the various target points in any order

5. Press **F4 – CAL** to calibrate.

6. Use the **up/down** and **left/right** arrows to adjust to the known thickness value, then remove fixture from probe.
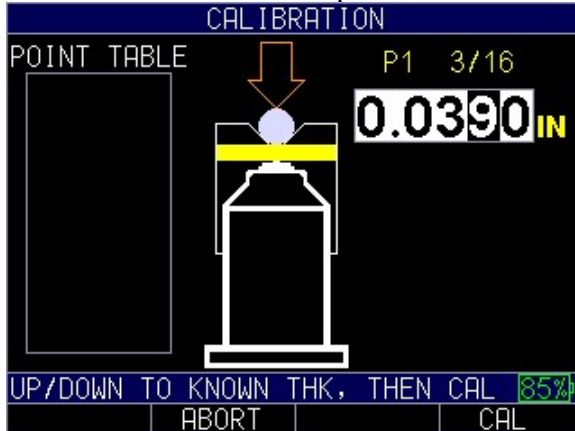
7. Press **F4 – CAL** to save reading. It will now display on the left hand side of the screen under **Point Table**

8. The gage will now prompt you to use the thickest calibration fixture. Repeat steps 4-7 using the thickest calibration fixture for your intended measurement range

9. The gage will now ask if you would like to add additional calibration points. Press **F1 – YES** to add more points or **F4 – NO** to end the calibration process.
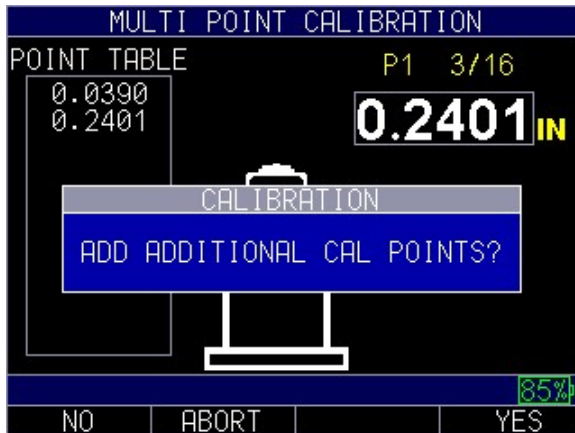
If you've selected to add additional points, referred to as, *multi point calibration*, continue by repeating steps 4-7 for all available target points. When you are finished, press **F1 - DONE.**   If, after pressing done, there are no readings on the screen, remove the ball and shim from the probe and press Q-Cal.
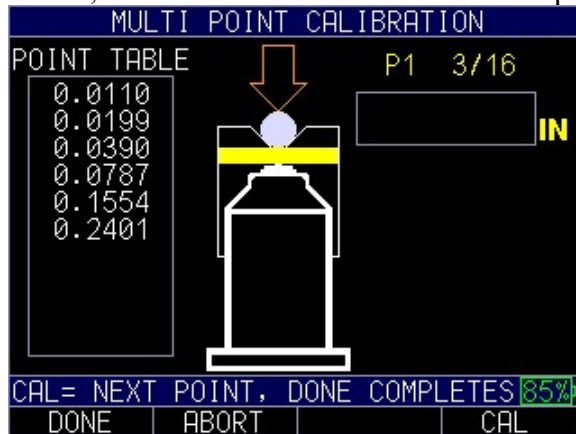
Quick Calibration (Q-Cal)

The Q-CAL or Quick calibration is a brief calibration that is necessary to compensate for temperature drift. It is strongly recommended to do a Q-CAL every 15 minutes particularly on parts thicker than 0.080" (2mm). The MTG-99 will prompt the user to perform a Q-CAL if it detects temperatures changes that will lead to errors. Q-CAL can be initiated either on the measurement screen or on the probe.

To perform a Q-Cal from the gage, follow these steps:

1. Go to the measurement screen, if you're in the main menu, press **F3 – Measure** to go to the measurement screen
2. Remove ball from probe and ensure it is not in close proximity to the probe
3. Press **F4 - Q-CAL**
4. A message that says "Quick Cal complete" will briefly appear on the screen when done
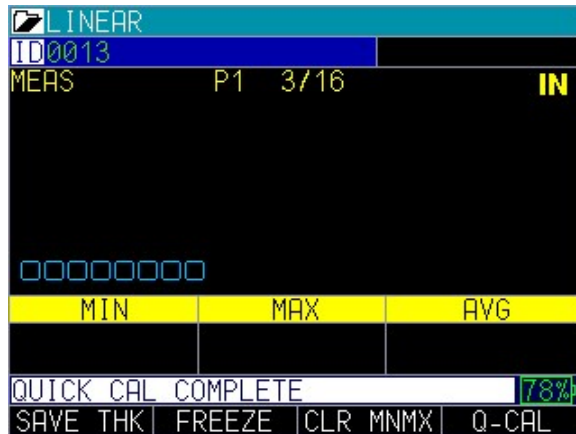
5.

To perform a Q-Cal from the probe, follow these steps:

1. Remove ball from probe and ensure it is not in close proximity to the probe
2. Press the **Q-CAL** button on the probe
3. A message that says "Quick Cal complete" will briefly appear on the screen when done
4.

> **Note:** It is strongly recommended to do a Q-CAL every 15 minutes, particularly on parts thicker than .080" or 2mm.

> **Note:** The ball must not be on or in close proximity to the probe while the Q-cal process takes place.

4 Customizing Display Options

Backlight

The gage is readable in direct sunlight as well as indoors. The backlight is always on by default, and it's highly recommended to leave it on when using the gage indoors.

To use the backlight, follow these steps:

1. Press the **MENU/OK** key to bring up the *Main Menu*.
2. Use the up and down arrow keys to select the **Display** option, and press the **MENU/OK** key.
3. Select the **Bklight** option, and press the **MENU/OK** key.

```
                      DISPLAY
  BKLIGHT            AUTO
  BRIGHTNESS         74%
  COLOR
  LARGE MEAS.        MEAS




  ↑/↓ TO NAV, MENU/OK TO SELECT  77%
      BACK           MEASURE
```
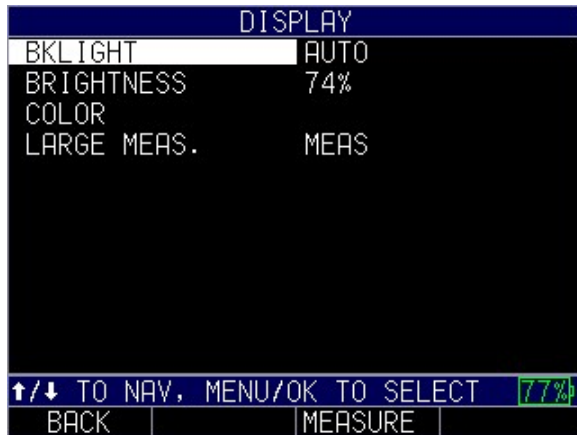
4. Use the up and down arrow keys to chose the any of the following parameters:
   - *Off*: Backlite remains off
   - *On*: Backlite remains on
5. Press the **MENU/OK** key or the **F1 – Back** key to exit the screen.

Color

The MTG-99 has a high-resolution color display with multiple color choices. By varying the colors, you can optimize visibility and improve contrast. You cannot chose two of the same colors, however, and the gage will prompt you to pick the next available color if a duplicate is selected.

Some color changes are dynamic, meaning you will see the changes as you make the selection (e.g., Flags, Background). Others, such as Pop Up Background, can only be seen once the change is made and you return to the respective screen where it would appear.

To adjust the color settings, follow these steps:

1. Press the **MENU/OK key**. The *Main Menu* appears.
2. Use the up and down arrow keys to select the **Display** option, and press the **MENU/OK** key.
3. Use the up and down arrow keys to select the **Color** option, and press the **MENU/OK** key.

4. The *Color Selection* screen will appear

5. You may select any of the following items in the list for color modification:
    - Background
    - Border
    - Flags
    - Grid
    - Pop up Background
    - Pop up Border
    - Pop up Text
    - Text

6. Press the **MENU/OK** key or the **F1 – Back** key to exit the screen.

Large Measurement

On the *measuremen*t screen where readings are displayed, you have the ability to control the largest displayed reading. The MTG-99 defaults to showing the current measurement value on the display, but if you have turned on features within the *measurements menu* you have the ability to choose which reading will appear largest on the screen.

Measurement Screen with Diff selected as the large measurement

To change the largest measurement displayed, follow these steps:

1. Turn on any measurement features you wish to use from within the *Measurements Menu.*
2. Press **MENU/OK** to enter the *Main Menu*
3. Use the up and down arrows to highlight **DISPLAY**
4. Press **MENU/OK** or the right arrow to enter the *Display Menu*
5. Use the up and down arrows to highlight **Large Meas.**
6. Press the right arrow to view available options
7. Use the up and down arrows to highlight the option you wish to have displayed largest.   Depending on the features turned on within the Measurements Menu.

```
                    DISPLAY
 BKLIGHT            AUTO
 BRIGHTNESS         74%
 COLOR
 LARGE MEAS.        MEAS      ·MEAS
                              MIN
                              MAX
                              AVERAGE




 ↑/↓ CHANGES VALUE, ← UNSELECTS  71%
   BACK            MEASURE
```
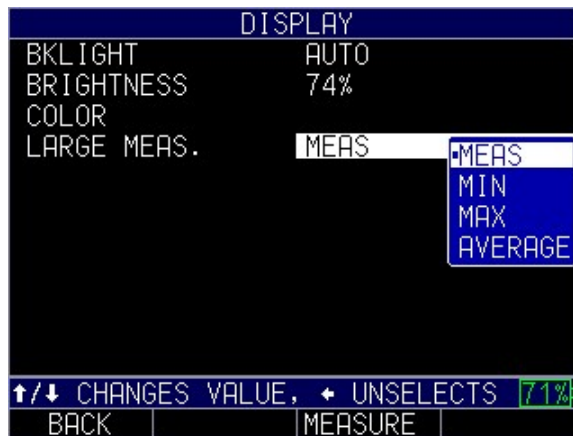
The following options may be displayed.   If they are not displayed, they have not been turned on in the Measurements Menu, not all options are available at the same time.

➢ *Meas.* – Displays the Current Measurement value
➢ *Max* – Displays the maximum value measured
➢ *Min* – Displays the minimum value measured
➢ *Max-Min* – Displays the sum of the maximum value minus the minimum value measured
➢ *Avg* – Displays the Average value (mean)
➢ *Diff* – Displays the Differential value.

8. When done press **F1 - BACK** or **MEASURE** to exit the menu

5 Adjusting the Initial Settings

The MTG-99 provides many usage settings that you can adjust depending on your location and preference.

To get to the *Initial Settings* screen, follow these steps first:

1. Press the **MENU/OK** key to open the *Main Menu*
2. Use the up and down arrow keys to select the **Initial Settings** option.
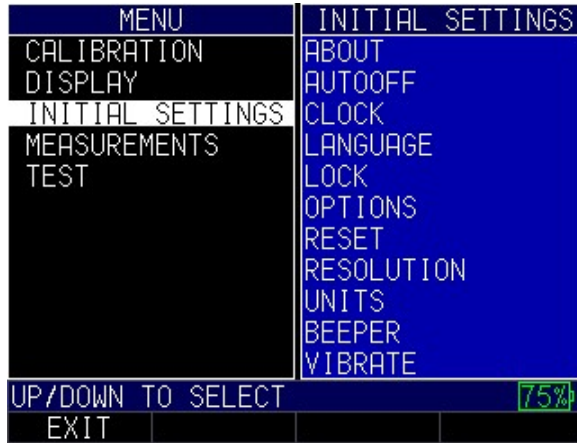
3. Press **MENU/OK** or use the **right arrow** to enter *Initial Settings*
4. Use the up and down arrow keys to select any of the settings you wish to change.
5. When finished, press the **F1 – Back** key to exit the screen.

About

The **About** setting will display the gage's current software version. If you would like further information about Danatronics, including contact information, follow these steps:

1. Use the up and down arrow keys to select the **About** option and press the **MENU/OK** key. A similar image to the one shown below will appear:

2. When finished, press the **F1 – Back** key to exit the screen.

Auto Off

The **Auto Off** setting shows the amount of time the gage will remain on during a period of inactivity. To change the parameters, follow these steps:

1. Use the up and down arrow keys to select the **Auto Off** option and press the **MENU/OK** key.

2. Use the up and down arrow keys to scroll through the following settings.
   - *1–31 minutes*: The gage will turn off automatically between 1–31 minutes
   - *Never*: The gage will never turn off automatically
3. When finished, press the **F1 – Back** key to exit the screen.

Clock

The gage has a real-time clock with several time and date formats in which to choose.

To change the clock parameters, follow these steps:

1. Use the up and down arrow keys to select the **Clock** option and press the **MENU/OK** key.

2. Use the up and down arrow keys to change the settings in the *Clock Setup* screen shown below:

```
         CLOCK  SETUP
 TIME FORMAT       12 HR
 DATE FORMAT       MM/DD
 MINUTE            19
 HOUR              10 PM
 DAY                9
 MONTH             JAN
 YEAR              2014



 <-CHANGE VALUE->            75%
     BACK
```
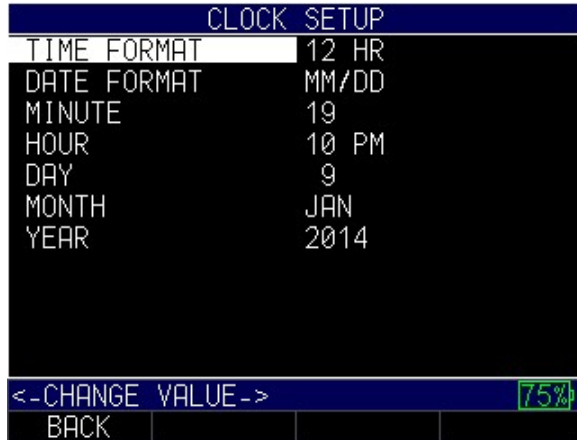
3. Use the left and right arrow keys to change any of the following settings:
   - *Time Format*: 12 hour or 24 hour
   - *Date Format*: Day/Month (DD/MM) or Month/Day (MM/DD)
   - *Minute*: Current minute (1–59)
   - *Hour*: Current hour (12 hour: 1–12 AM/PM; 24 hour: 1–23)
   - *Day*: Current day (1–31)
   - *Month*: Current month (Jan.–Dec.)
   - *Year*: Current year (2014–2025)
4. When finished, press the **F1 – Back** key to exit the screen.

Language

There are multiple pre-loaded languages on the gage, such as: English, Italian, Spanish, French, German, Russian, Czech, Finnish, Chinese, Japanese, Hungarian, and Portuguese. Please contact Danatronics if you require a language other than the ones provided.

To select a language, follow these steps:

1. Use the up and down arrow keys to select the **Language** option and press the **MENU/OK** key.

```
         INITIAL  SETTINGS
 ABOUT            V0.0.6
 AUTOOFF          NEVER
 CLOCK            10:19 PM  ENGLISH
 LANGUAGE         ENGLISH   ITALIANO
 LOCK             OFF       ESPANOL
 OPTIONS                    FRANCAIS
 RESET                      CESTINA
 RESOLUTION       0.01 MM   SUOMI
 UNITS            MM        DEUTSCH
 BEEPER           OFF       MAGYAR
 VIBRATE          OFF       PORTUGUE
 <-CHANGE VALUE->           SLOVAK
     BACK
```

2. Use the up and down arrow keys to change the setting.

3. When finished, press the **F1 – Back** key to exit the screen.

General Lock

The general **Lock** setting can be used to prevent unintentional key selection or calibration modification.

To select a parameter, follow these steps:

1. Use the up and down arrow keys to select the **Lock** option and press the **MENU/OK** key.


```
              INITIAL SETTINGS
    ABOUT            V0.0.6
    AUTOOFF          NEVER
    CLOCK            10:19 PM
    LANGUAGE         ENGLISH
    LOCK             OFF         ·OFF
    OPTIONS                      KEY
    RESET                        CAL
    RESOLUTION       0.01 MM
    UNITS            MM
    BEEPER           OFF
    VIBRATE          OFF
    <-CHANGE VALUE->             75%
        BACK
```

2. Use the up and down arrow keys to change any of the following settings:
   - *Off*: The gage lock is disabled.
   - *Key*: The keys on the gage are locked.
   - *Cal*: Calibration keys and values cannot be modified.
3. When finished, press the **F1 – Back** key to exit the screen.

Advanced Locks

Please see Section 7: Special Features for more information.

Options

The **Options** setting is used to unlock additional features that are available for purchase. The alphanumeric ID code will need to be provided to Danatronics with your purchase order and we will provide an unlock code that will also be entered on this screen.

To enter a key, follow these steps:

1. Use the up and down arrow keys to select **Options** and press the **MENU/OK** key.

2. Use the arrow keys to enter the correct Key code. After each numerical or alphabetical selection, press the **MENU/OK** key. Note, your selection will appear in the Key field.
3. If you make an error during the Key code selection process, press the **F2 – Del** key to delete the last entered selection.
4. When finished, press the **F3 – Done** key to complete the selection process or press the **F1 – Back** key to exit the screen.

Note: The Key code must be at least eight characters. An invalid message will appear if the Key code is incorrect.

Reset

You can reset the gage parameters back to the default settings by performing a gage reset.

Note: Performing a reset permanently deletes all of the saved parameters from the gage and replaces the settings with default values.

Parameter Reset

Performing a Parameter Reset restores default parameters to the factory settings. To perform a Parameter Reset, follow these steps:

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To perform a parameter reset, follow these steps:

9. Press **Menu/OK** to enter the *Main Menu*.
10. Use the up and down arrow keys to select **Initial Settings**.
11. Press the **MENU/OK** key.
12. Use the up and down arrow keys to select **Reset**.
13. Press the MENU/OK key
14. The *Reset* screen will then appear

```
            RESET
          DATABASE
         PARAMETERS
         ALL  ABOVE




REFRESH  SUCCESSFUL        85%
    BACK         |    ABOUT   |
```

15. Select the **Parameters** option, and press the **MENU/OK** key. The following screen appears:

```
            RESET


       RESTORE DEFAULT
         PARAMETERS
        ARE YOU SURE?




                          75%
    BACK  |   YES   |   NO   |
```

16. Press the **F2 – Yes** key to reset all parameters in the gage back to default settings, or press the **F3 – No** key to cancel a parameter reset.

Database Reset

Performing a Database Reset clears all the files in the database and keeps the first three: Linear, Row Increment and Col Increment database files with cleared readings. All of the user created files in the database will be cleared and deleted. To perform a Database Reset, follow these steps:

To perform a **Database** reset, follow these steps:

9. Press **Menu/OK** to enter the *Main Menu*.
10. Use the up and down arrow keys to select **Initial Settings**.

11. Press the **MENU/OK** key.
12. Use the up and down arrow keys to select **Reset**.
13. Press the MENU/OK key
14. The *Reset* screen will then appear

15. Select the **Database** option, and press the **MENU/OK** key. The following screen appears:

16. Press the **F2 – Yes** key to reset the database in the gage, or press the **F3 – No** key to cancel a parameter reset.

Database/Parameter Reset

Performing a Database/Parameter Reset clears all the files in the database and keeps the first three Linear, Row Increment and Col Increment database files with cleared readings. All of the user created files in the database will be deleted and the default parameters will be restored at the same time. This selection is the equivalent of performing MASTER RESET on the instrument, restoring original factory setting. To perform a Database/Parameter Reset, follow these steps:

8. Press **Menu/OK** to enter the *Main Menu*
9. Use the up and down arrow keys to select **Initial Settings.**

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10. Press the **MENU/OK** key.
11. Use the up and down arrow keys to select **Reset.**
12. Press the **MENU/OK** key to bring up the *reset* screen

```
                RESET
             DATABASE
             PARAMETERS
             ALL ABOVE




REFRESH SUCCESSFUL            85%
     BACK              ABOUT
```

13. Use the up and down arrow keys to select **Database/Parameter**
14. You will be asked if you're sure you want to reset your settings. Press the **F2 - Yes** key to reset the database/parameters in the gage back to default settings, or press the **F3 – No** key to cancel a database/parameter reset.

```
                RESET


          RESTORE DEFAULT
            PARAMETERS
          ARE YOU SURE?




                             75%
  BACK      YES      NO
```

Resolution

The **Resolution** setting defaults to auto and can be modified. The user can select between auto, 0.01, 0.001" and 0.0001" or 0.1mm, 0.01mm to 0.001mm using the same process described below.   When set to auto anything below 0.160"will be set to 4 digit resolution and above 0.160" will be set to 3 digit resolution.

To select a resolution parameter, follow these steps:

1. Use the up and down arrow keys to select the **Resolution** option and press the **MENU/OK** key.

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2. Use the up and down arrow keys to choose between the following options:

- 0.01 IN/0.1 MM
- 0.001 IN/0.01 MM
- 0.0001 IN/0.001MM

3. When finished, press the **F1 – Back** key to exit the screen.

Units

There are three different **Units** settings available on the gage. To select one, follow these steps:

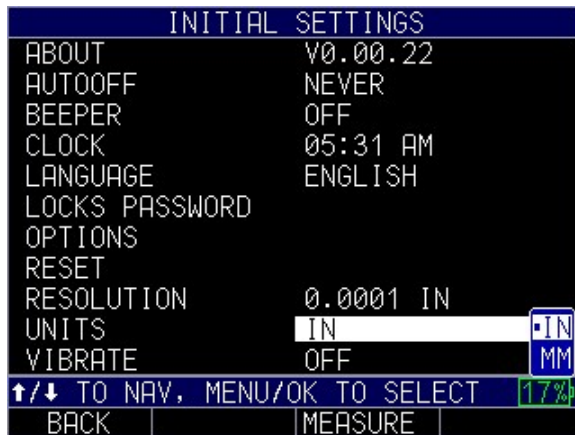1. Use the up and down arrow keys to select the **Unit** option and press the **MENU/OK** key.

2. Use the up and down arrow keys to chose between the following options:
- *IN*: Inch
- *MM*: Millimeter
3. When finished, press the **F1 – Back** key to exit the screen.

Beeper

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The **Beeper** setting is an audio feature that sounds when any key on the gage is pressed or if an alarm condition is triggered. (See Section 6 for more information about alarm settings.)

To turn on/off the **Beeper** feature, follow these steps:

1. Use the up and down arrow keys to select the **Beeper** option and press the **MENU/OK** key.

```
        INITIAL SETTINGS
ABOUT             V0.0.6
AUTOOFF           NEVER
CLOCK             10:22 PM
LANGUAGE          ENGLISH
LOCK              OFF
OPTIONS
RESET
RESOLUTION        0.01 MM
UNITS             MM
BEEPER           [OFF    ]    ▪OFF
VIBRATE           OFF          ON
<-CHANGE VALUE->               75%
   BACK
```

2. Use the up and down arrow keys to chose between the following options:
   - *Off*: Disables the Beeper option
   - *On*: Enables the Beeper option
3. When finished, press the **F1 – Back** key to exit the screen.

Vibrate

The gage will physically vibrate when this setting is enabled and an alarm condition is triggered. (See Section 6 for more information about alarm settings.)

To turn on/off the **Vibrate** feature, follow these steps:

1. Use the up and down arrow keys to select the **Vibrate** option and press the **MENU/OK** key.

```
        INITIAL SETTINGS
ABOUT             V0.0.6
AUTOOFF           NEVER
CLOCK             10:22 PM
LANGUAGE          ENGLISH
LOCK              OFF
OPTIONS
RESET
RESOLUTION        0.01 MM
UNITS             MM
BEEPER            OFF          ▪OFF
VIBRATE          [OFF    ]     ON
<-CHANGE VALUE->               75%
   BACK
```
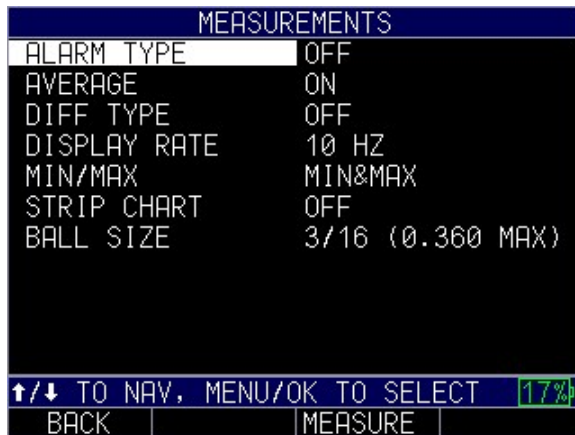
2. Use the up and down arrow keys to chose between the following options:
   - *Off*: Disables the Vibrate feature
   - *On*: Enables the Vibrate feature
4. When finished, press the **F1 – Back** key to exit the screen.

6 Changing Measurement Options

There are numerous options for taking measurements on the gage. All of the options can be made from the *Measurements* menu.

To get to the *Measurements* menu, follow these steps first:

1. Press the **MENU/OK** key to enter the *Main Menu*.
2. Use the up and down arrow keys to select the **Measurements** option and press the **MENU/OK** key.

3. Use the up and down arrow keys to select any of the settings you wish to change.
4. When finished, press the **F1 – Back** key.

When strip chart is on you can change the min/max of strip chart, the ID number and turn on alarms. You can set these various options from the *Measurements menu* and you can also change the settings when you are engaged in taking thickness measurements. For instance, if you are taking a reading and decide to enable or disable an option or change the value of a setting, simply use the right or left arrow keys to highlight the option you wish to change. Next, use the up and down arrow keys to modify the setting. Once you are satisfied with your changes, press the **F1 – Done** key and begin taking measurements with the new parameters.
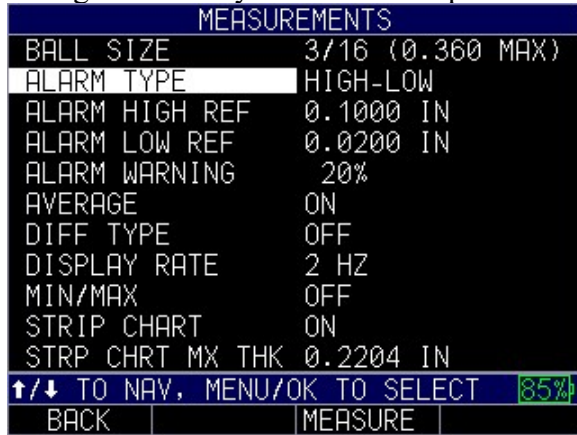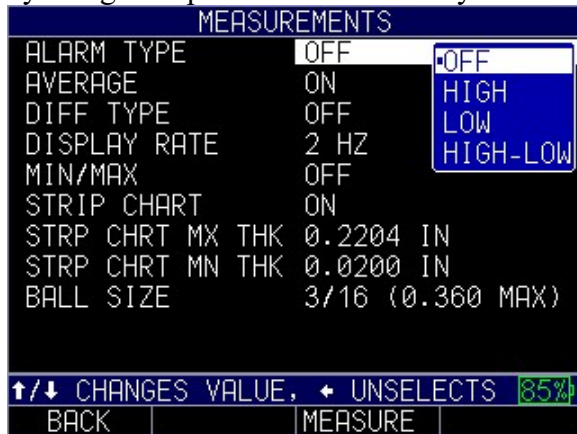

Alarm

The gage offers various alarm settings to alert you of low or high thresholds via audible sounds and sensational vibrations (if settings are enabled), flashing display, and illuminating keypad.

To set alarm thresholds, follow these steps:

1. Use the up and down arrow keys to select the **Alarm Type, Alarm High Ref, Alarm Low Ref or Alarm Warning** options and press the **MENU/OK** key or the right arrow key to enter the respective *Alarm menu*.

```
         MEASUREMENTS
 BALL SIZE       3/16 (0.360 MAX)
 ALARM TYPE      HIGH-LOW
 ALARM HIGH REF  0.1000 IN
 ALARM LOW REF   0.0200 IN
 ALARM WARNING    20%
 AVERAGE         ON
 DIFF TYPE       OFF
 DISPLAY RATE    2 HZ
 MIN/MAX         OFF
 STRIP CHART     ON
 STRP CHRT MX THK 0.2204 IN
 ↑/↓ TO NAV, MENU/OK TO SELECT  85%
   BACK      |    |MEASURE  |
```

2. If you select the **Alarm Type** option, you can chose from the following settings by using the up and down arrow keys:

```
         MEASUREMENTS
 ALARM TYPE      OFF       ▪OFF
 AVERAGE         ON         HIGH
 DIFF TYPE       OFF        LOW
 DISPLAY RATE    2 HZ       HIGH-LOW
 MIN/MAX         OFF
 STRIP CHART     ON
 STRP CHRT MX THK 0.2204 IN
 STRP CHRT MN THK 0.0200 IN
 BALL SIZE       3/16 (0.360 MAX)



 ↑/↓ CHANGES VALUE, ← UNSELECTS  85%
   BACK      |    |MEASURE  |
```

- *Off*: Disables the audible and vibrating alarm feature
- *High*: Alarm will occur when the displayed reading is higher than the high alarm reference value
- *Low*: Alarm will occur when the displayed reading is lower than the low alarm reference value
- *High-Low*: Alarm will occur when the displayed reading is less than the low alarm and/or greater than the High alarm reference value

3. If you select the **Alarm High Ref** option, you can change the high ref value. The reading and the **F1** key will illuminate red when a reading rises above the set value.

4. If you select the **Alarm Low Ref** option, you can change the low ref value. The reading and the **F1** key will illuminate red when a reading falls below the set value.
5. If you select the **Alarm Warning** option, you can change the percentage value between 0 and 100%. The percentage entered is based on the high and low set points. When a reading falls above or below this percentage, the waveform and the **F2** key will illuminate yellow.
6. When finished, press the **F1 – Back** key to exit the screen.

Note: The Alarm Low Ref limit will not go beyond the Alarm High Ref limit.

As noted above, the color of the reading will dynamically change to red, yellow, or green depending on the reading and alarm value settings.

Red refers to a reading that is above or below the current low or high alarm value:

Yellow indicates caution—the reading is nearing the Warning percentage set for a low or high alarm value:

Green shows that the reading is safe within the alarm value margins:

For this example, assume you're using a 3/16 target ball with a range from 0.0001 to 0.360". If you turn on alarm high-low you will first need to enter the high value. Enter 0.300 inches and press the **MENU/OK** key.

Next you will need to enter the low value , enter 0.100 inches. The display will ask you to enter the percent reading of the high-low. The gage will default to 20% (this can be changed with the up or down arrow keys), so any reading within 20% of the high value (approaching high, between 0.240" and 0.299" as 0.240" is within the 20% range of 0.300") will result in the yellow keypad illuminating. Also, any reading above the low value of 0.101" and 0.120" will result in the yellow **F2** key illuminating as you approach the minimum.

In **Alarm** mode, choosing a non-zero percent value provides a warning for readings that approach the selected percent value of the high or low limits. For example, if the alarm value is 0.100" and 20% is entered as the "percent value," reading from 0.101" to 0.120" will result in the **F2** "yellow" key being illuminated. Also, reading less than 0.100" will result in the **F1** "Red" key being illuminated and greater than 0.120" will result in the **F3** "Green" key being illuminated.

Vibrating Alarm Display

 The vibrating alarm, noted with a **bell icon** and two curved lines to the right of the gage display, can be enabled with varying alarms and alarm conditions.   The Vibrating alarm will use the conditions set above and will vibrate the gage upon alarm condition when turned on.   Unlike the other features in this section, vibration is not turned on in the *measurements menu* and instead is found in the *initial settings menu.*

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Average

When average is turned on it will display the Average (mean) value on the measurements screen in addition to the current measurement.
To turn **Average** on or off, follow these steps:

1. Use the up and down arrow keys to select the **Average** option and press the **MENU/OK** key or the **right arrow** to enter the *Average Menu*.
2. Use the up and down arrow keys to select either of the following options
   ➢ *On*: Turns on the Average feature and displays reading on measurement screen
   ➢ *Off*: Disables the average feature
3. When finished, press the **F1 – Back** key to exit the screen.

Differential (Diff)
The Differential option displays the difference in value between the reading and the entered reference value.

To set the **Diff** options, follow these steps:

1. Use the up and down arrow keys to select the **Diff TYPE** option and press the **MENU/OK** key or the **right arrow** to enter the *Diff Menu*.
2. Use the up and down arrow keys, followed by the **MENU/OK** key, to select any of the following options:
   ➢ *Off*: Disables the Diff feature
   ➢ *Absolute*: When this mode is enabled, the gage will display a thickness value as an absolute number of what has been entered. For example, diff abs = 0.500" and the real thickness is 1.000", the display will show diff abs 0.500". If the real value is 0.300", the gage will display, -0.200".
   ➢ *Percent*: When this mode is enabled, the displayed value will be listed as a percentage of the value entered as the diff. For Example, if you set the diff to percentage at 0.500", a reading of 0.250" will result in 50%.
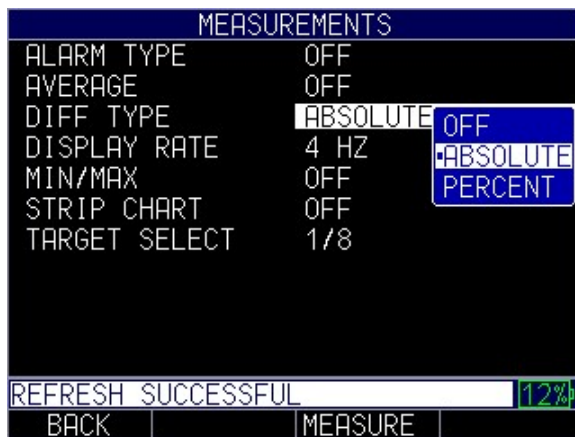
3. If Absolute or Percent are chosen a new field, **DIFF REF VALUE**, will appear. Use the **up and down arrows** to enter the desired value

```
         MEASUREMENTS
STRIP CHART       ON
STRP CHRT MX THK  0.0458 IN
STRP CHRT MN THK  0.0141 IN
TARGET SELECT     1/8
ALARM TYPE        LOW
ALARM HIGH REF    0.1000 IN
ALARM LOW REF     0.0200 IN
ALARM WARNING      20%
AVERAGE           OFF
DIFF TYPE         ABSOLUTE
DIFF REF VALUE    0.1000 IN
↑/↓ TO NAV, MENU/OK TO SELECT  22%
   BACK     EDIT   MEASURE
```

4. When finished, press the **F1 – Back** key to exit the screen.

Display Rate

The display rate determins how often the measurement thickness values displayed on the screen are refreshed. Min/Max and Max-Min both always operate at 60hz, but will update the displayed value based on the set display rate.

To adjust the **Display Rate**, follow these steps:

1. Use the up and down arrow keys to select the **Display Rate** option and press the **MENU/OK** key or the **right arrow** to enter the *Display Rate Menu*.
2. Use the up and down arrow keys, to adjust the display rate up or down.
3. When finished, press the **F1 – Back** key to exit the screen.

Min/Max

The Min/Max option provides multiple options for displaying the maximum and minimum values on the measurement screen.

To set the **Max/Min** options, follow these steps:

1. Use the up and down arrow keys to select the **Max/Min** option and press the **MENU/OK** key or the **right arrow** to enter the *Min/Max menu*.
2. Use the up and down arrow keys, followed by the **MENU/OK** key, to select any of the following options:
    ➢ *Off*: Disables the Min/Max feature
    ➢ *Min&Max*: Displays both the Minimum and Maximum values measured on the measurement screen
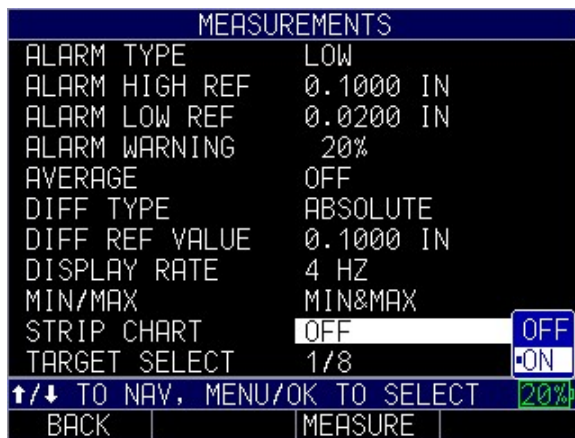   ➢ Max-Min: Displays the sum of the maximum value measured minus the minimum value measured

Note: To clear and reset Mix/Min values while making readings, press **F3**
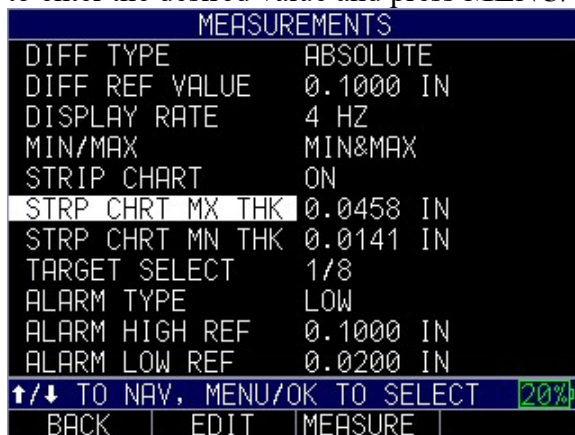
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Strip Chart
The strip chart displays a continuous graphic recording of the recorded data. It is a graphical representation of the thickness profile of the low and high values entered. They can be entered from the measurements menu or read time from the measurement screen.

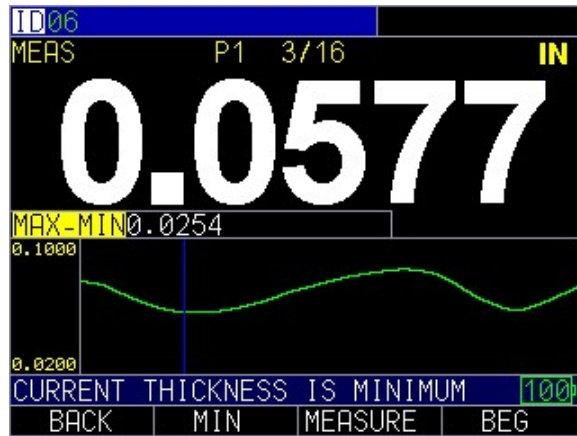To set the **Strip Chart** options, follow these steps:

1. Use the up and down arrow keys to select the **Strip Chart** option and press the **MENU/OK** key or the **right arrow key** to enter the *Strip Chart Menu*.
2. Use the up and down arrow keys, followed by the **MENU/OK** key, to turn the strip chart on or off
   - ➢ *On*:Enables the Strip Chart feature
   - ➢ *Off*: Disables the Strip Chart feature

```
            MEASUREMENTS
 ALARM TYPE        LOW
 ALARM HIGH REF    0.1000 IN
 ALARM LOW REF     0.0200 IN
 ALARM WARNING      20%
 AVERAGE           OFF
 DIFF TYPE         ABSOLUTE
 DIFF REF VALUE    0.1000 IN
 DISPLAY RATE      4 HZ
 MIN/MAX           MIN&MAX
 STRIP CHART       OFF           OFF
 TARGET SELECT     1/8           •ON
 ↑/↓ TO NAV, MENU/OK TO SELECT  20%
    BACK         MEASURE
```

3. If on is chosen a new field, **STRP CHRT MX THK** and **STRP CHRT MN THK**, will appear with the max value highlighted. Use the **up and down arrows** to enter the desired value and press **MENU/OK.**

```
            MEASUREMENTS
 DIFF TYPE          ABSOLUTE
 DIFF REF VALUE     0.1000 IN
 DISPLAY RATE       4 HZ
 MIN/MAX            MIN&MAX
 STRIP CHART        ON
 STRP CHRT MX THK  0.0458 IN
 STRP CHRT MN THK  0.0141 IN
 TARGET SELECT      1/8
 ALARM TYPE         LOW
 ALARM HIGH REF     0.1000 IN
 ALARM LOW REF      0.0200 IN
 ↑/↓ TO NAV, MENU/OK TO SELECT  20%
    BACK     EDIT   MEASURE
```

4. Repeat Step 5 for the minimum value
5. When finished, press the **F1 – Back** key to exit the screen.

Measurement screen with strip chart turned on

Ball Size

The ball size measurement menu option allows the user to enter in the target ball size they will be using when making measurements.

To adjust the target ball size, follow these steps:

1. Use the up and down arrow keys to select the **Ball Size** option and press the **MENU/OK** key or the **right arrow** to enter the *Ball Size Menu*.
2. Use the up and down arrow keys to select the desired target ball size
3. When finished, press the **F1 – Back** key to exit the screen.

7 Special Gage Functions

The MTG-99 has many special functions that go beyond the basics. This section will discuss these special gage functions in detail.

Test

The **Test** option is designed to perform one or many internal tests on the gage to make sure it is running optimally. The **Test** option is found under the *Menu* settings.

To perform a **Test**, follow these steps:

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1. Press the **Menu/OK** key to enter the *main menu*
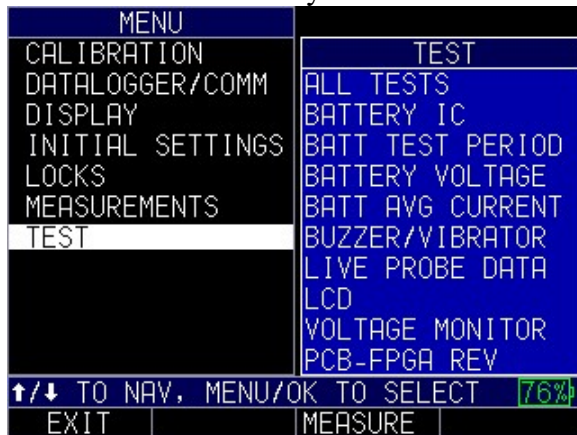
2. Use the up and down arrow keys to select the **Test** option and press the **MENU/OK** key.
3. Use the up and down arrow keys to scroll through the tests in which you would like to select.
4. Press the **MENU/OK** key once you have selected the test you wish to perform.
5. When finished, press the **F1 – Back** key.

Using the Freeze Option

For the MTG-99, you can freeze and hold your measurement value via the **Freeze** option.

To use the **Freeze** option, follow these steps:

1. From the measurement screen, press the **F2 – Freeze** key.

   The following screen is display whereby showing the "F" flag next to the thickness reading. You are now in **Freeze** mode. The **F2** selection changes from **Freeze** to **Unfreeze**. While in **Freeze** mode, the menu options are disabled.
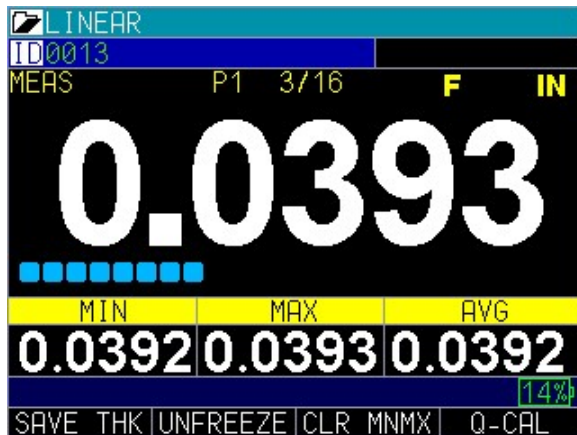

2. Press the **F2 - Unfreeze** key to disable **Freeze** mode.

Advanced Locks

There are several types of advanced locks from which to choose. The available options are ideal for supervisors or managers who need to protect settings from being changed by other users. These advanced lock options are located in the main menu.

To use advanced **Locks**, follow these steps:

1. From the Measurement screen, press the **Menu/OK** key. The *Menu* screen appears.
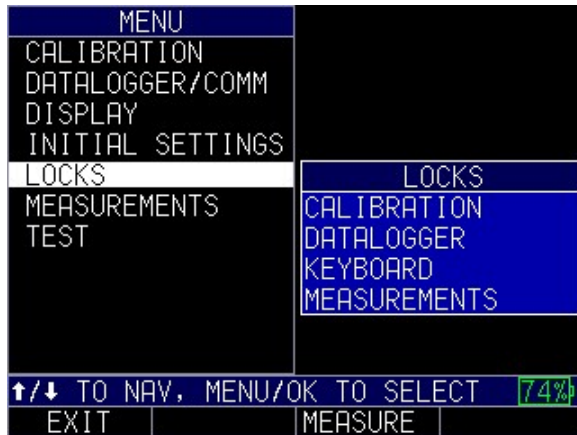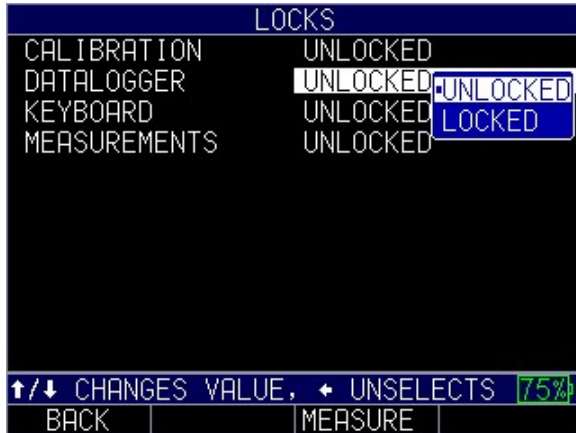

2. Use the up and down arrow keys to select the **Locks** option, and press the **MENU/OK** key.


The following lock options are available:
- *Calibration*: Locks or unlocks calibration settings
- *Datalogger*: Locks or unlocks datalogger settings
- *Keyboard*: Locks or unlocks the keyboard
- *Measurements*: Locks or unlocks measurement settings

When locked, a lock symbol will appear next to the locked feature or a stored setup, as shown below:

To set a password for the advanced **Locks** feature, you must first go to the *Initial Settings* screen by following these steps:

1. From the *Measurement* screen, press the **Menu/OK** key.
2. Use the up and down arrow keys to select the **Initial Settings** option.
3. Press the **MENU/OK** key.
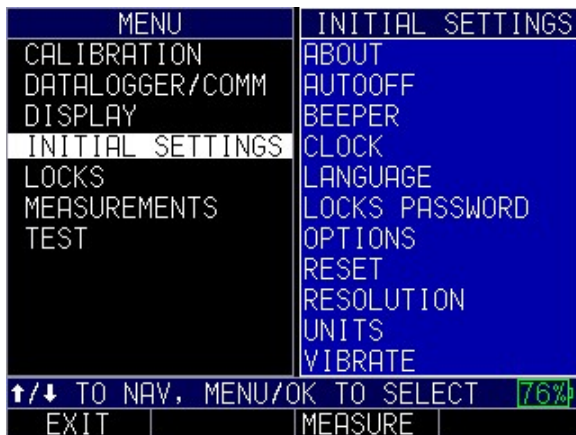
4. Use the up and down arrow keys to select **Locks Password**.

5. Press the **MENU/OK** key.

6. Enter your 4-digit password/code by scrolling over each character and pressing the **MENU/OK** key.

```
         ENTER NEW PASSWORD
LOCKS PASSWORD: _


   1  2  3  4  5  6  7  8  9  0

   A  B  C  D  E  F  G  H  I  J

   K  L  M  N  0  P  Q  R  S  T

   U  V  W  X  Y  Z  -  +



REFRESH SUCCESSFUL              78%
   BACK   |  DELETE  |   SET
```

7. Press **F3 – Set** key to complete the password.

Note: If you forget or want to clear the password, enter 0081 to reset it. Once the code is activated, any locked function will require the password to unlock it.

To clear a password, you will first need to enter your 4-digit password. Next, **press F3 – Clear** key when done:

```
         CLEAR PASSWORD
LOCKS PASSWORD: 1111


   1  2  3  4  5  6  7  8  9  0

   A  B  C  D  E  F  G  H  I  J

   K  L  M  N  O  P  Q  R  S  T

   U  V  W  X  Y  Z  -  +



REFRESH SUCCESSFUL              84%
   BACK   |  DELETE  |  CLEAR
```

8 Datalogger/Comm

All MTG-99 gages come with an internal datalogger that is able to save or send readings. All of the options can be changed from the *Datalogger/Comm Menu*.

To get to the *Datalogger/Comm Menu*, follow these steps:

1. Press the **MENU/OK** key to enter the *Main Menu*.
2. Use the up and down arrow keys to select the **Datalogger/Comm** option and press the **MENU/OK** key.
3. Use the up and down arrow keys to select any of the settings you wish to change.

```
                DATALOGGER/COMM
 DATALOGGER DIR
 DATALOGGER MEDIA  GAGE
 F1 FUNCTION       SEND
 OUTPUT FORMAT     DETAIL
 OVERWRITE         OFF
 SAVE              THICKNESS
 SEND              THICKNESS
 SEND VIA          USB



 ↑/↓ TO NAV, MENU/OK TO SELECT    77%
    BACK      |        |MEASURE |
```

4. When finished, press the **F1 – Back** key.

Working with the Datalogger Directory

The datalogger has a built-in file and data management system. Each thickness reading is stored and tagged with an alphanumeric identification number and file name with descriptive field. A complete description of the measurement type, gage calibration, and setup parameters are stored along with each reading.

Existing Datalogger file

To use an exiting **Datalogger Directory file**, follow these steps:

1. Use the up and down arrow keys to select the **Datalogger Directory** option and press the **MENU/OK** key
2. Wait a few moments while the gage populates a list of current files. There are two default file types available, Linear and Two Dimensional.

Default Datalogger Directory – Linear file is selected as noted by the yellow folder

3. Use the up and down arrow keys to select either of the following options (skip to step 6 for F key instructions). A yellow folder will appear next to the file that was last selected for use.
    ➢ *Linear*: Columns
    ➢ *Two Dimensional*: Columns and Rows
    ➢ *There may also custom user created files*

4. Press **MENU/OK** to select
5. The gage will then bring you to the respective menu screen that will offer the following options.   Use the **up** and **down arrow** keys followed by the **MENU/OK** key to select.   Press **F1 – Back** when done
    ➢ *Clear all Readings:* Clears all readings from the datalogger file. Gage will ask if you're sure, press **F2** for Yes, **F3** for No or **F1** to exit and go back.
    ➢ *Copy:* Copies readings to new Datalogger file.   Gage will bring you to a screen that asks you to type in a file name.   See: *Creating a New Datalogger* file in the next section below
    ➢ *Export:* Exports the data outside of the gage. Gage will ask if user wants to overwrite file, press **F2** for Yes, **F3** for No or **F1** to exit and go back.
    ➢ *Open*: Opens the file for use and brings user to the measurement screen. F2
    ➢ *Review Details*: Opens the file for viewing

Example of Linear Datalogger review screen

6. The user can also navigate basic Datalogger directory functions with the **F** keys as indicated below
   - ➢ F1 – Back: Takes you out of the *datalogger directory menu* to the main *datalogger menu*
   - ➢ F2 – Open: Selects the currently highlighted file for use and opens the measurement screen.
   - ➢ F3 – Measure: Opens the file that has been preselected and is designated by a yellow folder to the left of the file name and brings the user to the measurement screen


   - ➢ F4 – Create: Opens a brand new file that needs to be set up. *See: Instructions for Creating a new Datalogger file below*

7. When done, press **F1-Back**

Creating a new Datalogger file

> **Note:** New files can be created on the gage, on a computer with DataXL or on a phone/tablet via DataXL Mobile for gages equipped with Bluetooth

1. Use the up and down arrow keys to select the **Datalogger Directory** option and press the **MENU/OK** key
2. Wait a few moments while the gage populates a list of current files. Then press **F4- Create** to create a new file
3. The gage will prompt you to enter a file name. Use the **arrow** keys to highlight the desired letter, then press **MENU/OK** to select.   You will see the letter appear just under where it says file name (where it says ABC_ in the below image)
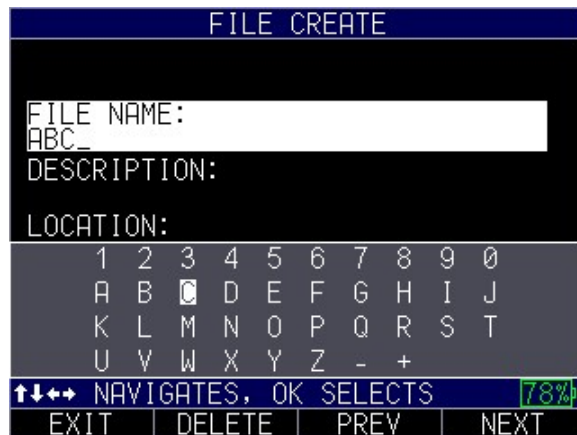
4. You will have the option to enter Description, Location and Inspector ID and Prefix information.   These fields are optional.   Use the **arrow** keys followed by menu ok to enter information into these fields, or press **F4 -Next** to skip and move to the next field

> **Note:** It is not necessary to enter data into such fields as: Description, Location, Inspector ID, or Prefix.

5. The gage will ask for a file type.   Use the right arrow followed by MENU/OK to select the desired file type from the below options
   - *Linear*: file contains rows and columns
   - *Linear + CPT (Custom point)*: same as the linear file, but with the ability to add custom points
   - *2D*: file contains rows and columns, like a grid
   - *2D + CPT (Custom Point)*: same as the 2D file, but with the ability to add custom points
   - *3D*: file contains rows, coumns and points
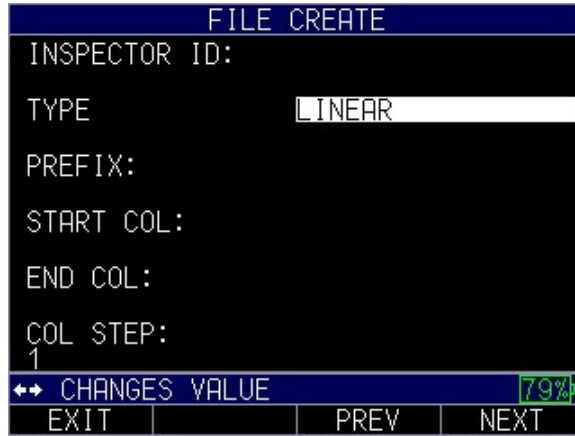
6. The gage will then give the option to enter a prefix. This is optional
7. For all options. The gage will then ask for starting and ending columns.   Use the **arrow** keys followed by **MENU/OK** to enter in the column values.   The starting and ending IDs must have the same number of characters.

   For 2D files the gage will also ask for Row start and end points
   For 3D files the gage will ask for starting and ending columns, rows and points.

Start Col
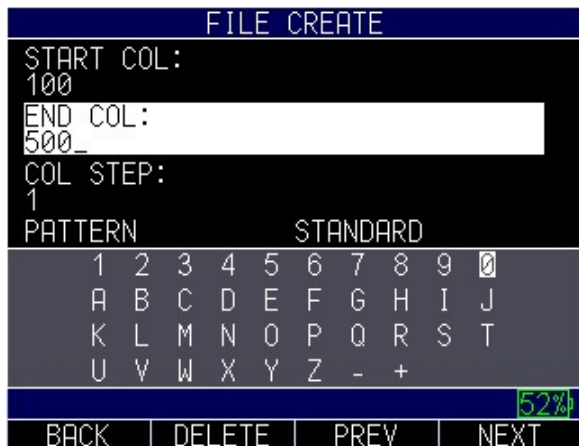
End Col

> **Note:** It is imperative that the starting and ending IDs always have the exact same number of digits.

8. If a **custom point** option has been selected the user will be asked to choose from the following list of custom point options.   Use the **right arrow key** to highlight the desired option then press

   ➢ *Degree:* 0, 90, 180, 270
   ➢ *LCR:* Left, Center, Right
   ➢ *LCRB:* Left, Center, Right, Bottom
   ➢ *LR:* Left, Right
   ➢ *Manual*
   ➢ *NESW:* North, East, South, West
   ➢ *TBLR:* Top, Bottom, Left, Right

   Use the **right arrow key** to set the first increment to either column or custom point and press **F4 - Next**

9. Use the **right** and **left** arrow keys to select the column step value.

   Set to 1 to save readings to consecutive IDs, set to another number to save in IDs in the respective increments

10. Use the **up** and **down arrow** keys to select the pattern of how the gage will save readings
    ➢ Standard: When the file reaches the end of the ID string, it will start again at the first reading
    ➢ Reverse: When the file reaches the end of the ID string, it will start saving from the last number

Standard   Reverse

11. Press **F4 – Done** when all options have been entered to create the file and go back to the list of Datalogger directory files. Highlight the file you wish to use and press **F2 – Open** to begin making measurements

Measurement screen with file name ABC and ID 0001 (top left corner)

Reviewing a Datalogger File

1. Use the up and down arrow keys to select the **Datalogger Directory** option and press the **MENU/OK** key

2. Use the **up** and **down arrow keys** followed by the **MENU/OK** key to select the **file you wish to review**

3. The current file's menu will open. Either use the **up** and **down arrow keys** to highlight **Review Details** and press **MENU/OK** or press **F4 - Review**

4. Use the up and down arrow keys to view the data and select from the following options

   ➢ To set the next ID for save, highlight then press **Menu/OK** to go to the measurement screen and begin saving readings
   ➢ If the ID already contains data you can also choose the following F key options

- *F2 – Recall*: recalls the parameters from when the previous readings were taken. Press **F4 – Yes** to load the previous parameters or **F1 – No** to go back
- *F3 – Clear*: Clears the previous parameters
- *F4 – Beg*: Goes to the beginning of the file. After Beg is pushed **F4 – End** will appear. **F4 – End** brings the user to the furthest ID from the beginning that's been accessed

  ➢ If the ID doesn't contain data you can also choose the following F key options
  - **F2 – Sel ID**: Selects the currently highlighted ID for the next save
  - **F3 – Measure:** Goes to the measurement screen using the last saved ID to determine the next ID that will be saved
  - *F4 – Beg*: Goes to the beginning of the file. After Beg is pushed **F4 – End** will appear. **F4 – End** brings the user to the furthest ID from the beginning that's been accessed

Datalogger Media

The datalogger media option allows the user to choose where data will be stored; either on the gage (approx. 1MB) or on the SD card (2GB standard)

To set the **Datalogger Media** option, follow these steps:

1. Use the up and down arrow keys to select the **Datalogger Media** option and press the **MENU/OK** key or the **right arrow** to enter the *Datalogger Media menu*.
2. Use the up and down arrow keys, to select from the following options:
   ➢ *Gage*: Saves readings directly to the gage's internal flash memory. Able to store 100,000+ thickness readings
   ➢ *SD Card*: Saves readings to the micro SD card inserted in the gage. Able to store over 98 million thickness readings
3. When finished, press the **F1 – Back** key to exit the screen.

F1 Function

The F1 function allows the user to choose where datalogger readings are sent. They can be stored internally or sent outside of the gage to other programs depending on the particular gage's hardware.

To set the **F1 Function** option, follow these steps:

1. Use the up and down arrow keys to select the **F1 Function** option and press the **MENU/OK** key or the **right arrow** to enter the *F1Function menu*.
2. Use the up and down arrow keys, to select from the following options:

> *Save*: Saves readings to either the gage's internal memory or the SD card depending on what the user has selected in the Datalogger Media option
> *Send*: Does not store the reading on the gage or SD card and instead sends the reading outside the gage via one of the following options
>   • Bluetooth: Available as a custom hardware/software option sending. Can be used to send readings to DataXL Mobile.
>   • RS232: Available as a custom port option.   Allows integration with certain SPS programs
>   • USB: Available on all gages, allows for transfer of readings via USB port.

Note: Bluetooth and RS232 can not be installed on the gage simultaneously, only one or the other can be installed

3. When finished, press the **F1 – Back** key to exit the screen.

Output Format

The **Output Format** is used to specify the level of detail provided by the gage to the datalogger file for viewing in outside programs like Excel.

To set the **Output Format** option, follow these steps:

1. Use the up and down arrow keys to select the **Output Format** option and press the **MENU/OK** key or the **right arrow** to enter the *Output Format menu*.
2. Use the up and down arrow keys, to select from the following options:
   > *Grid*: Only saves the thickness reading to the file
   > *Detail:* Saves the thickness reading as well as any other reading types that are turned on to the same ID ie Average, Diff, Min, Max, Max-Min
3. When finished, press the **F1 – Back** key to exit the screen.

Overwrite

The overwrite option allows the user to specify whether or not it will allow the gage to overwrite previously saved readings.

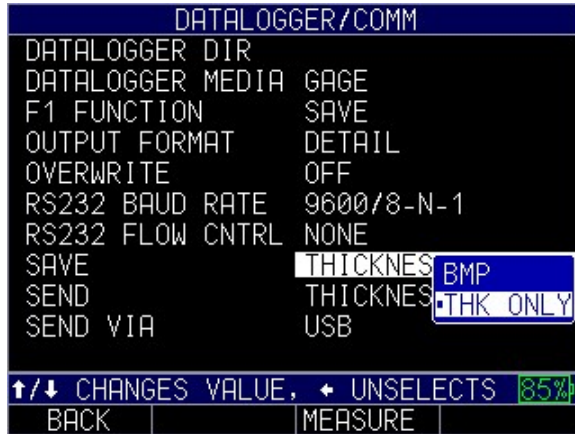To set the **Overwrite** option, follow these steps:

1. Use the up and down arrow keys to select the **Overwrite** option and press the **MENU/OK** key or the **right arrow** to enter the *Overwrite menu*.
2. Use the up and down arrow keys, to select from the following options:
   > *On*: Allows data to be overwritten
   > *Off:* Does not allow data to be overwritten
3. When finished, press the **F1 – Back** key to exit the screen.

Save

The MTG-99 can save thousands of thickness readings either internally or onto a removable SD card when the **F1 Function** is set to **Save.** The Save option allows the user to select which data will be saved when the **F1 - Save Function** is used.

To use the **Save** option, follow these steps:

1. Use the up and down arrow keys to select the **Save** option and press the **MENU/OK** key or the **right arrow** to enter the *Save menu..*

```
        DATALOGGER/COMM
DATALOGGER DIR
DATALOGGER MEDIA  GAGE
F1 FUNCTION       SAVE
OUTPUT FORMAT     DETAIL
OVERWRITE         OFF
RS232 BAUD RATE   9600/8-N-1
RS232 FLOW CNTRL  NONE
SAVE              THICKNES BMP
SEND              THICKNES THK ONLY
SEND VIA          USB

↑/↓ CHANGES VALUE, ← UNSELECTS  85%
   BACK         |  MEASURE  |
```

2. Use the up and down arrow keys to toggle between the following settings:
    *   *BMP*: Bitmap or screen shot captures
    *   *THK ONLY*: Thickness only
3. When finished, press the **F1 – Back** key to exit the screen.

After this selection is made, when the gage's F1 function is set to save, the **F1** key will display BMP or SAVE THK depending on what was selected.

The data saved will depend on your *datalogger directory* setup parameters. For example, if the **Notes** option is set to **Off** then saved thickness reading will be stored at the ID location [Linear], [Row], [Col] without notes.

When the save key is pressed, the gage saves all of the different values, Thickness, Diff, Min, Max and Avg, depending on what readings you have turned on from the Measurements menu.

Send

The MTG-99 can send data to external sources when the **F1 Function** is set to **Send.** The send option allows the user to select which data will be sent to the user specified location (Bluetooth, RS232 or USB) when the **F1 - Send Function** is used

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To set the **Send** option, follow these steps:
1. Use the up and down arrow keys to select the **Send** option and press the **MENU/OK** key or the **right arrow** to enter the *Send menu*.
2. Use the up and down arrow keys, to select from the following options:
   - ➢ *Thickness*: Sends the thickness reading
   - ➢ *Diff:* Sends the differential value
   - ➢ *Max* – Sends the maximum value measured
   - ➢ *Min* – Sends the minimum value measured
   - ➢ *Max-Min* – Sends the sum of the maximum value minus the minimum value measured
   - ➢ *Avg* – Sends the Average value (mean)
   - ➢ *All* – Sends all of the above values

3. When finished, press the **F1 – Back** key to exit the screen.

Send Via

The **Send Via** option allows the user to select how data will be sent outside the gage.

To set the **Send Via** option, follow these steps:
1. Use the up and down arrow keys to select the **Send Via** option and press the **MENU/OK** key or the **right arrow** to enter the *Send Via menu*.
2. Use the up and down arrow keys, to select from the following options:
   - ➢ Bluetooth: Available as a custom hardware/software option sending. Can be used to send readings to DataXL Mobile.
   - ➢ RS232: Available as a custom port option. Allows integration with certain SPS programs
   - ➢ USB: Available on all gages, allows for transfer of readings via USB port.

3. When finished, press the **F1 – Back** key to exit the screen.

> **Note:** Bluetooth and RS232 can not be installed on the gage simultaneously, only one or the other can be installed

9 Hardware Options

All hardware options can be added to the gage upon initial order or gages can be sent in after they've been in the field for modification.

Bluetooth

Bluetooth allows the MTG-99 to export data such as thickness readings or files to another device via internal bluetooth. DataXL mobile can be used to facilitate the transfer of information on IOS and Andriod devices via DataXL Mobile.

Footswitch

The footswitch hardware upgrade to allows the user to use a physical footswitch to save or send readings and certain assigned values (Thickness, Differential, Min/Max, Max-Min, Average or Strip Chart) via the USB cable or Bluetooth (if applicable).

To use the footswitch, follow these steps:

1. Plug the footswitch cable into the connector on the top left of the MTG-99
2. The **Send** and **Save** keys will now activate whenever the footswitch is pressed When the footswitch is pressed it will perform the action defined for the F1 key. Can also change send via USB/RS232/Bluetooth depending on which optional features are in your gage (RS232 and Bluetooth are not standard and can not co-exist).
3. Enable the Send/Save in the *Datalogger/Comm menu* and assign it to the feature you would like the footswitch to use

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RS232

RS232 is a custom port used to facilitate the transfer of data outside of the gage
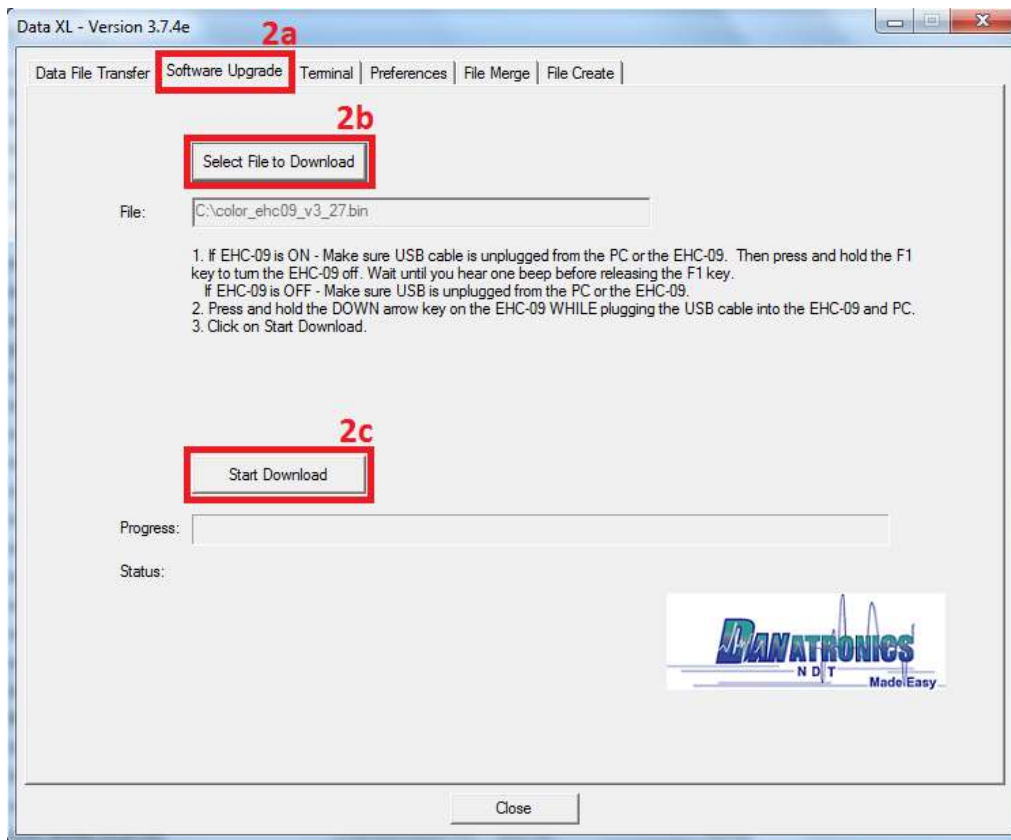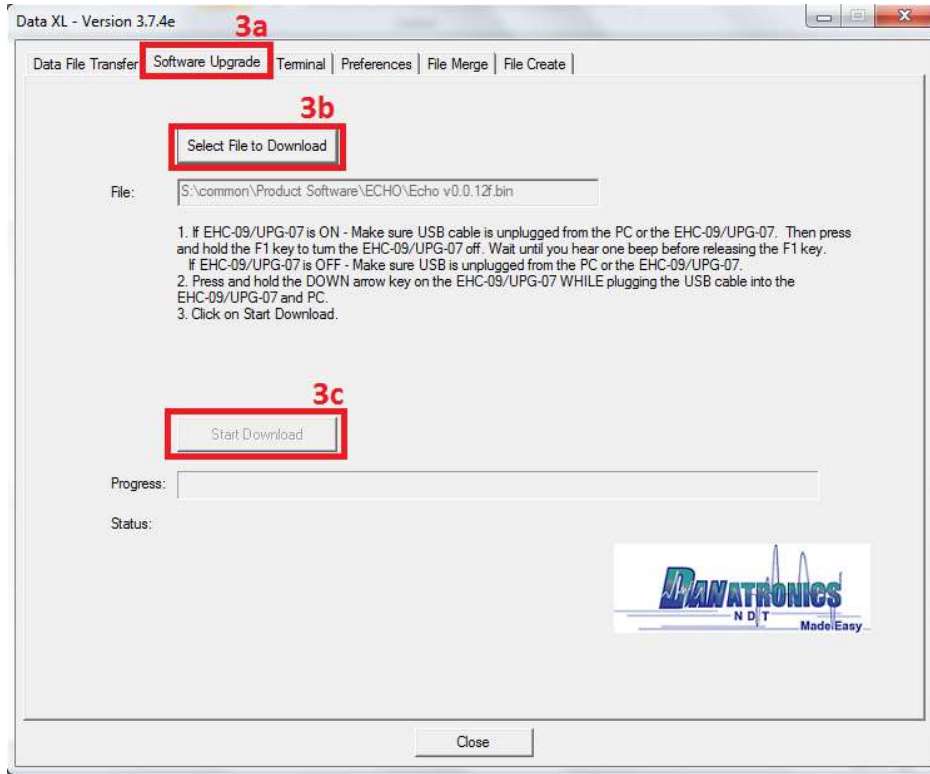
9 DataXL

DataXL is the computer software program used to transfer files to/from the MTG-99 and to update the MTG-99 to the latest revision of software.

Updating the MTG-99

To update an MTG-99, follow the below steps:

1. Power on the MTG-99 by holding the **F1** key until the unit beeps and displays the splash screen.
2. Connect the MTG-99gage via a USB cable to a computer that already has Data XL software (v3.17.0 or higher) installed on it.
3. Launch Data XL software.

   3a. Click the **Software Upgrade** tab located in the upper portion of Data XL.

   3b. Click the **Select File To Download** button, which will launch an open file dialog box. Select the file to update the ECHO 9 gage. (In the example below, the file **Echo v.0.0.12f.bin** was chosen

   3c. Click the **Start Download** button, which will commence with the software update. The MTG-99 should display the message "**Launching Update**" on the screen. Shortly after, the update program will proceed to update the gage. Once the update is complete, the screen will display a message to "**Unplug USB cable to turn off power**". At this point, the software update process is completed.

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Exporting Files from a Gage

The steps in this section need to be performed to export a file from the gage to a computer via USB. You will need the following:

- An MTG-99
- Mini B USB cable
- A Computer with Windows XP, 7, 8 or 10 operating system
- Data XL (to download the latest version of Data XL click on the following link http://www.danatronics.com/ultrasoundsupport.html

To export files from a gage, follow these steps:

1. Plug the USB cable into the gage and the host computer.
2. Turn the gage on by holding the **F1** key until the gage beeps.
3. Launch Data XL on the host computer.
4. Click the "Refresh Gage Button" button in Data XL to get the file list loaded into Data XL.
5. The files that are present in the gage will now appear in the left side file list in the "Gage" area. Select the file you wish to export to the computer by left clicking it once.
6. Click the ">> Transfer >>" button to export the file from the gage to the computer. The exported file will now appear on the right side file list in the "Host PC" area. To view the file, double click the filename located on the right side file list in the "Host PC" area.

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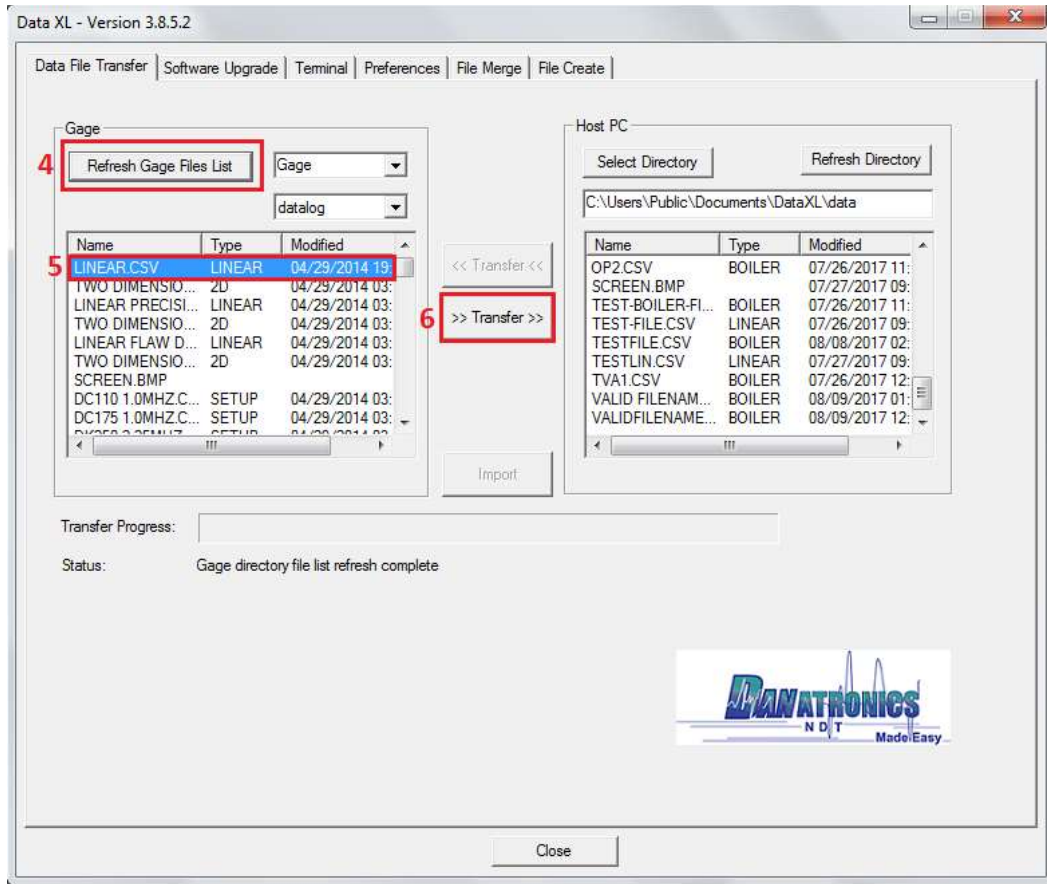
10 Technical Specifications (check section number should stay before tech support)

MTG-99 Product Specifications

Overall Dimension: 7.25" L x 4.00" W x-2.00" H (184mm x 101.6mm x 50.8mm)

Weight: 1.15 lbs (.52 kg) with internal Li-Ion battery

Operation temperature: -4 to 122F (-20 to 50C)

Keypad: Illuminating rubber keypad

Languages: English, French, German, Spanish, Italian, Russian, Czech, Finnish, Chinese, Japanese, Hungarian

Data Storage: Onboard & removable up to 32 GB MicroSD card

Battery Life: 16 h (lithium-ion) (TBD) AC

Power Requirements: AC Mains: 100 VAC to120 VAC, 200 VAC to 240 VAC

Display Type: 3.5" high resolution color TFT display, 320 x 240 pixels (1/4 VGA), sunlight readable, including multiple color pallets

Backlight: Light Emitting Diode (LED) backlight. Includes variable light intensity.

Display Dimensions: (W x H, Diag.) 2.76 in. x 2.07 in., 3.5 in. (70.08 mm x 52.56 mm, 88.9 mm)

Min/Max Capture Mode: Captured at 60 Hz measurement rate Display

Formats: 4 modes; Thickness only, Thickness with 3 additional customizable choices, Thickness and Strip chart, Grid View

Display Update Rate: 4, 8, 16 and 20 Hz

Alarm: High and Low alarms with vibrate feature

Thickness Range: 0.0001"-1.00" (0.001-25.4 mm) of any non-ferrous material with access to both sides

Resolution: 0.01 in. (0.1 mm), 0.001 in. (0.01 mm), 0.0001 in. (0.001 mm), (depending on thickness range)

Data Logger: Internal file-based alphanumeric data logger

Memory Card: Maximum capacity: 32 GB removable MicroSD memory card

Shutoff: selectable 1-31 minutes or "Never" shut off

Inputs/Outputs: USB 2.0 peripheral, port RS-232 (Optional), Bluetooth (optional): Send and receive readings and files via Bluetooth

Environmental Testing: Designed for IP67

MTG-99 Probe Specifications

Probe Specifications				
Targets **PR-1**	**Min Thickness**	**Max Thickness**	**Accuracy**	
			Basic Calibration	**Multipoint**
1/16 in. (1.58 mm) ball (TB-062)	0.0001 in. (0.001 mm)	0.080 in. (2.03 mm)	4%	3%
1/8 in. (3.17 mm) ball (TB-125)	0.0001 in. (0.001 mm)	0.240 in. (6.1 mm)	4%	2%
3/16 in. (4.76 mm) ball (TB-187)	0.0001 in. (0.001 mm)	0.360 in. (9.1 mm)	3%	1%
1/4 in. (6.35 mm) ball (TB-250)	0.0001 in. (0.001 mm)	0.360 in. (9.1 mm)	3%	1%
3/16 in. (4.76 mm) magnetic ball (MTB-187)	0.160 in. (4.06 mm)	0.750 in. (19.05 mm)	3%	1%
1/4 in. (6.35 mm) magnetic ball (MTB-250)	0.160 in. (4.06 mm)	1.00 in. (25.4 mm)	3%	1%

12 Technical Assistance

Danatronics, Corp.

Call Danatronics, Corp. at 978-777-0081 or email us at sales@danatronics.com for specific technical assistance or troubleshooting questions.