

Quick Start Guide

**UPG-07C/UPG-07 CW/UPG-07 DLCW
Ultrasonic Thickness Gages**

Software version X.XX



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 ULTRASONIC THICKNESS 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 to issue Ultrasonic Level I, 40 hour class room training in Ultrasonic Theory. Danatronics, Corp. and any of its employees or representatives shall not be held responsible for improper use of this equipment for its intended use. Proper training, a complete understanding of Ultrasonic wave propagation, thorough reading of this manual, proper transducer selection, correct zeroing of the transducer, correct sound velocity, proper test blocks, proper cable length, proper couplant selection all play a factor in successful ultrasonic thickness gaging. Special care should be taken when test pieces have rough or painted surfaces, particularly those applications where the test piece is thin to begin with as doubling of the echoes is possible even if the transducer is capable of measuring the desired thickness. As transducers wear or heat up, results can be either too thin due to a lack of sensitivity as a result of wear or too thick due to heating up of the transducer, referred to as "drift."

1. Installing Batteries

In order to install batteries in any of UPG-07 series unit, open the battery door at the bottom left of the unit. Slide in two AA batteries with positive terminal of both batteries facing towards top of the unit. Close the battery door tight enough so that the batteries make contact with both the battery terminals.

2. Powering ON/OFF

To power ON the unit press and hold the F1 key for about three seconds. The LCD will display the company information briefly and then go to transducer selection screen. These two screens are as shown below. To power off the unit press and hold the F1 key for about three seconds. The LCD will briefly display the company information with a 'counting down' clock and then power off.

NOTE: If the gage is set up for right hand operation, the F1 and F3 display prompts will be reversed.



Company information screen



Transducer selection screen

3. Selecting Transducer

Upon viewing the first screen, choose the transducer that matches the list above. Here is a Description of the above abbreviations:

DEF=Default

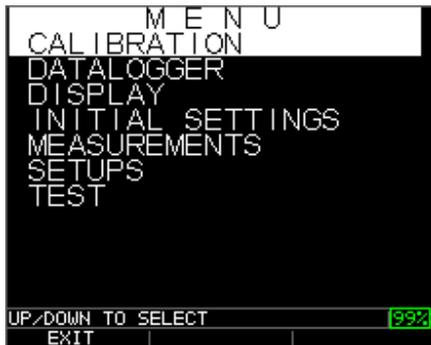
S= Steel

P= Plastics

1=Class one or the measured time from main bang to first backwall echo. C1 is the most common and easiest to use but are less accurate than class 3 and the minimum thickness is larger than class 2 or 3. C1 is good for most materials.

2=C2 or the measured time from the interface echo (echo off delay line or waterpath) to first back wall echo. C2 is ideal for thin materials, curved parts or high temperature with a high temp. delay line. Can also be used in immersion. C2 is ideal for plastics, composites and thin materials.

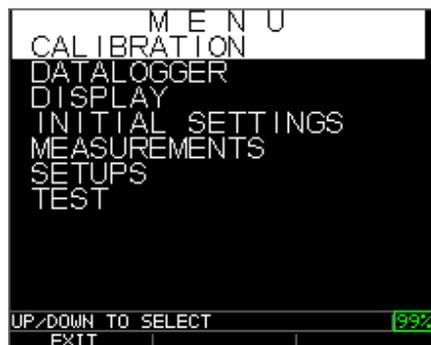
3= Class 3 or measured time between echoes following in interface. C3 is the most accurate because we measure the echoes within the material not affected by pressure used, amount of couplant or cable attenuation. C3 is also ideal for thin materials as well as materials such as steel, aluminum and ceramics where multiple echoes exists.



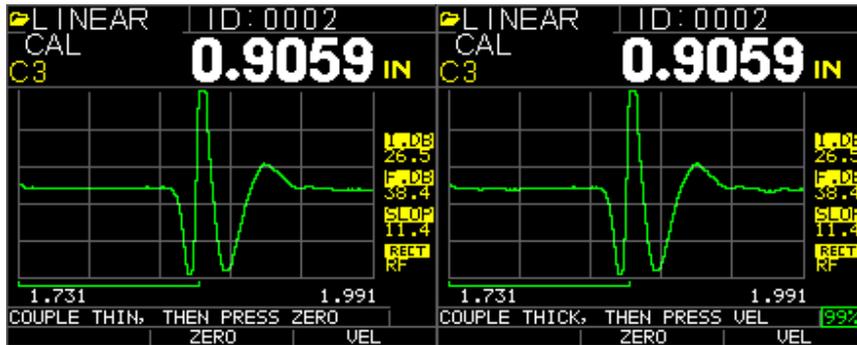
A new transducer can be selected from the Transducer selection screen, which appears after the device powers on. The transducer selection screen can also be accessed from the main menu and **Setup** as seen above.

While in the transducer selection screen, go to the transducer option that matches the part number on the actual transducer and material S or P and by pressing up or down arrow keys. The next screen will then be ready to make measurements. If gain, range, blankings and other parameters need to be adjusted, please refer the our more detailed product manual.

Example of Velocity and Zero values after Auto zero



Press Menu OK, scroll to Calibration, press menu O.K. for the following screens



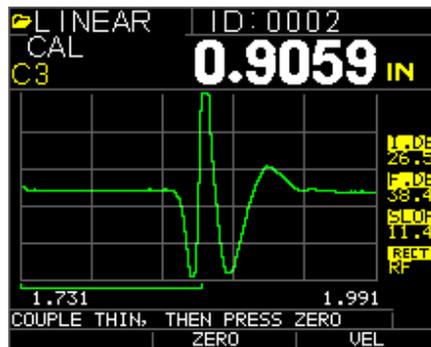
Note the gage displays what to press, i.e. couple to thin, press Zero (F2), then press up/down to known thickness then Cal (F3). Couple to Thick, press Vel for Velocity (F3), up/down to known thickness then Menu O.K.

4. Calibrating the Gage

Calibrating is the process of adjusting the gage for a specific material and transducer before testing the material to make sure that all measurements are accurate. You must always calibrate before measuring material for standard accuracy. The following steps show how to perform velocity cal, zero cal, velocity and zero cal and delay-line cal. You will need a test step block or a sample representing the thin and thick sections of a known thicknesses and same material to perform accurate calibration.

a. Velocity Calibration Only

To perform any calibration, first go to the Measure mode and press Menu/OK. Then go to the Cal option in the Menu screen and press OK. The following Cal mode screen should appear. To exit the Cal screen without performing any calibration, press OK. To proceed to velocity cal, follow the following instructions.



Cal screen for non-datalogger version

While measuring the thicker step, select VEL by pressing F3. After selecting VEL, you can take the transducer off the test block. If the displayed measurement is different than the known value of the step, use the up or down arrow key to adjust the displayed value to the known value of the step. Press OK to perform the calibration. The unit will briefly display the calibrated velocity value in the top of the screen and then return to Measure mode.

b. Zero Calibration Only

To perform a zero calibration, go to the Cal mode as shown in part a. While measuring the thinner step, select ZERO by pressing F2. After selecting ZERO, you can take the transducer off the test

block. If the displayed measurement is different than the known value of the step, use the up or down arrow key to adjust the displayed value to the known value of the step. Press OK to perform the calibration. The unit will briefly display the calibrated zero value in the top of the screen and then return to Measure mode.

c. Velocity and Zero Calibration

To calibrate both velocity and zero at the same time, first go to the Cal mode as shown in part a. While measuring the thicker step, select VEL by pressing F3. After selecting VEL you can take the transducer off the test block. If the displayed value is different than the known value of the step, adjust the value by pressing up or down arrow keys and press F1/CAL. While measuring the thinner step, select ZERO by pressing F2. After selecting ZERO you can take the transducer off the test block. If measured value is different than the known value of the step, adjust the measured value by pressing up or down arrow key and then press MENU OK. The unit will briefly display the calibrated zero value and then return to Measure mode. Note that the order of Velocity and Zero calibration can be reversed. If Velocity calibration is performed after Zero calibration, the calibrated velocity value will be displayed at the end of the calibration process.

d. Delay Line Calibration

Delay line calibration is done every time the thickness gage is powered on and a transducer is selected, or when a different transducer is selected during normal operation. Please see section 3 above for instructions on Delay line calibration, which is the same as performing an Auto-zero.

NOTE: Once any of the above calibrations is performed, verify the accuracy of the readings using the test step block.



GENERAL KEYPAD OPERATION

To change any parameter settings press Menu/OK and then go to the Setup option by pressing up or down arrow keys. Press OK to go to the Setup screen. The Setup screen lists the parameters as shown above. Go to the desired parameter from the list by pressing up or down arrow keys. You can change the settings for that parameter directly from the Setup screen by pressing the left and right arrow keys. Otherwise you can press OK to list all the settings for that parameter on a new screen and then go to the desired setting from the list and press OK. The display will return to the Setup screen with the new setting. For more detailed information on parameter settings, please refer to EHC-09 series User's Guide on the CD provided with the gage. Notice Vel for velocity is one of the settings, therefore, sound velocities can be entered manually by highlighting over Vel and using the left or right arrow to adjust then Menu OK to accept the new value.

1. Taking Measurements

Once an Auto-zero is performed on the selected transducer, the unit automatically goes to the Measure mode as shown below.



Measure mode

To take thickness readings, the user can simply apply the couplant to the surface and put the transducer to measure thickness. Depending on the parameter settings, the display may show other parameters. For more detailed information on Measure mode, please refer to the UPG-07 series User's Guide on the CD provided with the gage.

2. Changing the Parameter Settings from the Main A-Scan or Measurements Screen

The following is a list of available parameters:

- I. DB for Initial Gain 26.5 dB
- F. DB for Final Gain 38.4DB
- SLOP for Slope...rate at which linital gain and Final gain adjust
- RECTIFY RF, Full, Halt+, Half – (RF is Default)
- RANGE .5, 1, 2, 5, 10, 20 inch or Zoom

- MB Blank for Main Bang Blank...see more detailed manual
- IF Blank (C2 and C3 only)...see more detailed manual
- C3 Blank (C3 only)...see more detailed manual
- Echo Window means end of measured time
- Echo 1 detect + or –
- Echo 2 detect + or –
- Pulsr Vol for Pulser Voltage...30V, 60 V, 120V

3. Changing the Parameter Settings from the Display Screen

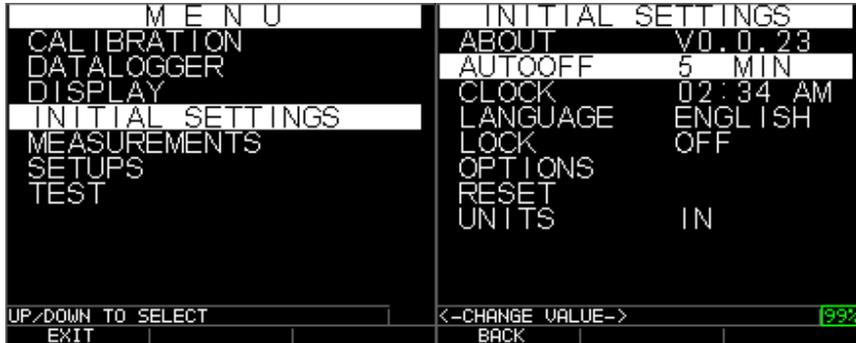


The following is a list of available parameters:

- BACKLIGHT OFF, ON, AUTO
- COLOR SELECTS COLORS FOR BACKGROUND, FLAGS, GRID, TEXT AND WAVEFORM
- SHOW Waveform or Thickness

USER LEFT HAND, RIGHT HAND
 WAVEFORM Filled or Outline

4. Changing the Parameter Settings from the Initial Setup Screen



The following is a list of available parameters:

ABOUT	SOFTWARE VERSION NUMBER
AUTOOFF	1-31 MINUTES, NEVER
CLOCK	SET TIME AND DATE FOR DATALOGGER STAMP
LOCK	LOCK CALIBRATION OR KEYBOARD
OPTIONS	USED TO ENABLE OPTIONAL SOFTWARE FEATURES
RESET	RESET PARAMETERS, DATABASE OR BOTH
UNITS	IN. MM, USEC

5. Changing the Parameter Settings from the DATALOGGER Screen

The following is a list of available parameters:

Directory	Enables set up of all datalogger files..see long form manual
NOTES	OFF, On

To change any parameter settings press Menu/OK and then go to the Setup option by pressing up or down arrow keys. Press OK to go to the Setup screen. The Setup screen lists the parameters as shown above. Go to the desired parameter from the list by pressing up or down arrow keys. You can change the settings for that parameter directly from the Setup screen by pressing the left and right arrow keys. Otherwise, you can press OK to list all the settings for that parameter on a new screen and then go to the desired setting from the list and press OK. The display will return to the Setup screen with the new setting. For more detailed information on parameter settings, please refer to the EHC-09 series User's Guide on the CD provided with the gage.