

Quick Start Guide



ECHO 7 Thickness Gages

V 2.0



Batteries

ECHO Series Thickness Gages come standard with a rechargeable Li-Ion battery located on the back of the gage under the door with the screw. Fully charge your unit before using by plugging the USB cable into the top of the gage and to the included AC wall adapter.



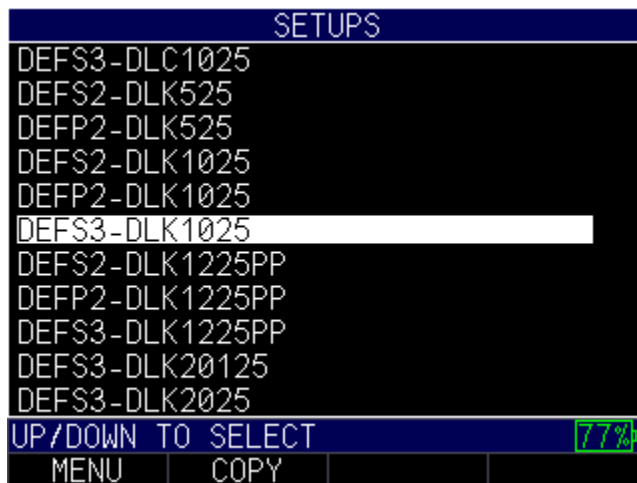
When charging, the F4 key will light up blue. The blue light will turn off when fully charged. Allow up to 10 hours for a full charge.

When the gage is turned on, there is a battery indicator on the bottom right hand corner of the screen showing the % battery life remaining

1. Powering ON/OFF

To power on the unit, press and hold the F1 key for more than three seconds. The LCD will briefly display the company information and then the Transducer Setup selection screen will appear as shown below. To turn off the unit, press and hold the F1 key for about three seconds.

Note: If the gage is set up for left hand operation, the F1 and F4 display prompts will be reversed.

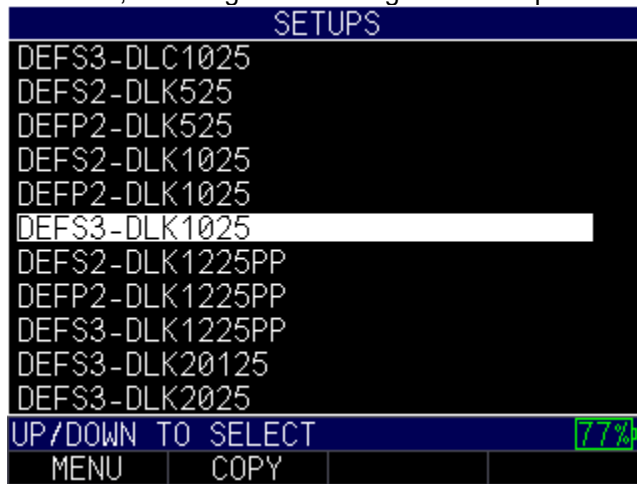


2. Using Keypad Functions

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 function, F2 with the Freeze function, or F4 can change the display format of how large the thickness value is. There are 4 settings to toggle through for gages equipped with as a DLW or datalogger with waveform.

3. Selecting Transducer and Performing Auto Zero

A new transducer can be selected from the Transducer Setup selection screen, which appears after the unit powers on. The Transducer Setup selection screen can also be accessed by going to the Menu, selecting Initial Settings then Setup Selection.



Transducer selection screen

While in the Transducer Setup selection screen, go to the transducer options that match the part number on your actual transducer, the material S (Steel) or P (Plastic), and class type using the up/down arrow keys. Press the green Menu/ok button then press F4 to begin making measurements.

Stored Setup 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 is 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.

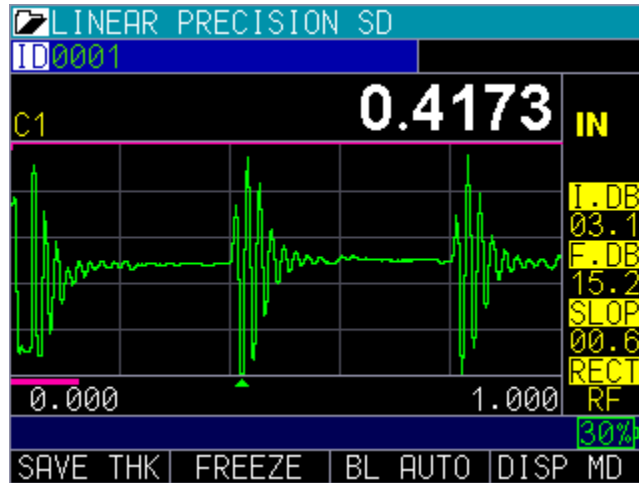
3= Class 3 or measured time between echoes following in interface. C3 is the most accurate because we measure the echoes within the material not affected by pressure used, amount of

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.

5= Class 5 or the A2-DFR CLF4 transducer setup found in the transducer menu of the ECHO 7/Precision meets Boeing's specification to inspect a range from .007"- 1.0" with one transducer and one setup. (requires appropriate transducer)

Description of Classes of Measurements:

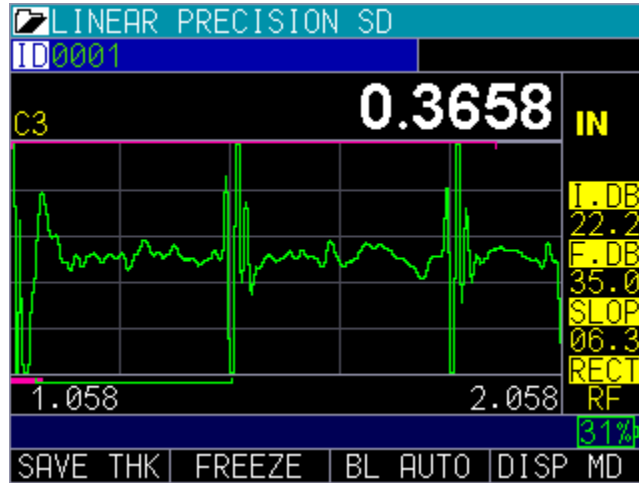
DEFP2- DLK1025 is a default class 2 set up for P for Plastics with a 10 Mhz, .25 inch probe. DEFS is for Steel and the classes of measurement are either 1, 2 or 3. Class one uses a contact transducer to measure the time from initial pulse or main bang to first backwall echo. Class 2 is uses a delay or immersion probe and measures the time from the interface echo to first back wall echo. Class 3 also uses a delay line or immersion probe and measures the time between multiple echoes after an interface echo.



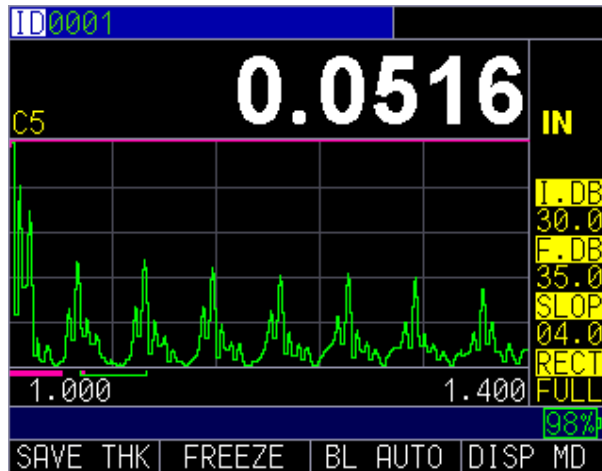
Class 1 with cursor on first backwall echo



Class 2 with interface echo at left and first detected backecho on right. Also shown in interface blank (dead zone) below the interface echo.



Class 3, marker shows measured time between echo 1 and echo 2 after an interface echo. Also shown is the blank after first



Class Five for A2-DFR CLF4 transducer

After selecting transducer, the transducer setup screen will appear. Press F4 measure to use the default parameters and go directly to the measurement screen or make any necessary parameter adjustments prior to pressing F4

DEFS3-DLK1025	
ECH01 DET	+
ECH02 DET	-
ZERO	0
PULSR VOLT	120 V
DELAY	AUTO
MEAS MODE	CLASS 3
INIT GAIN	22.2 DB
FINL GAIN	29.8 DB
SLOPE	02.5 DB/US
VEL	0.23300 IN/US
OXIDE VELOCITY	0.23300 IN/US
<-CHANGE VALUE-> [77%]	
BACK	MEASURE

Make any necessary adjustments then F4 for to go to the Measurement screen

Saving and discarding an altered stored setup:

When making a change to any parameter to a default setup, the ECHO will put an asterisk next to the file indicating something has changed. Your choice is to Save the new setup by pressing F2 and typing in a new name or discarding the changes by pressing F3. The ECHO can save more than 2,600 custom setups which is ideal for varying applications.

SETUPS	
DEFS3-DLC1025	
DEFS2-DLK525	
DEFP2-DLK525	
DEFS2-DLK1025	
DEFP2-DLK1025	
DEFS3-DLK1025 *	
DEFS2-DLK1225PP	
DEFP2-DLK1225PP	
DEFS3-DLK1225PP	
DEFS3-DLK20125	
DEFS3-DLK2025	
UP/DOWN TO SELECT [79%]	
MENU	SAVE DISCARD

Note: The default setups will not be erased when assigning a new Setup File

4. Calibrating the Gage

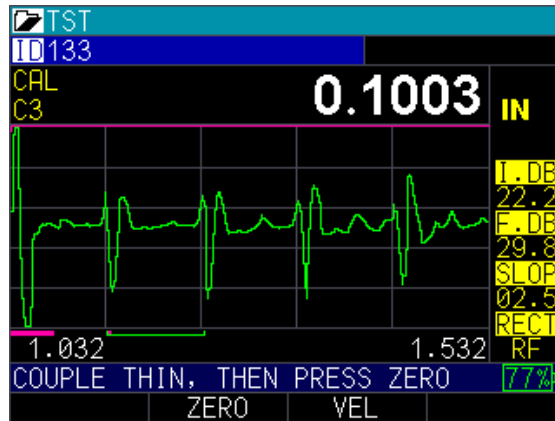
Calibrating is the process of adjusting the gage for a specific material and transducer before testing the material to make sure that all measurements are accurate. You must always calibrate before measuring material for standard accuracy. The following steps show how to perform velocity cal, zero cal,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

a. Velocity Calibration Only

To perform a velocity calibration, press the Menu/OK key and scroll to calibration and press Menu/OK

To perform a velocity calibration, While measuring the thickest piece of your test sample, select F3 - VEL key. After pressing the F3 key, 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 the MENU/OK key 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.



Cal screen for datalogger version

b. Zero Calibration Only

To perform a zero calibration, go to the Calibration mode as shown in part a. While measuring the thinner step, press the F2 – Zero key. After selecting the F2 key you can take the transducer off the test block. If the measured value is different than the known value of the step, adjust the measured value by pressing up or down arrow keys. Press the MENU/OK key 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 (Most accurate and recommended method)

To calibrate both velocity and zero at the same time, first go to the Calibration mode as shown in part a. While measuring the thinnest step, press F2 – ZERO and then use the up or down arrow keys to scroll through the thickness value number to the known thickness. Then press the F1 - CAL key. While measuring the thickest step, press the F3 - VEL key after which time 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 the MENU/OK key to perform the calibration. For a few seconds in the top left hand corner, the calculated acoustic sound speed will be displayed.

Note: 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 in the top left of the display.

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

5. Taking Measurements

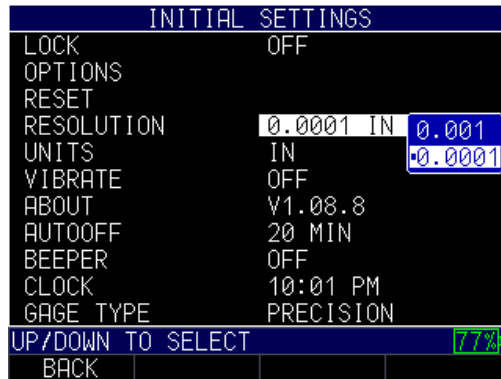
After an Auto Zero is performed on a selected transducer, the unit automatically goes to the Measure mode as shown below.



To take thickness readings, simply apply couplant (fluid in gage kit bottle) to the material's surface followed by the transducer to measure the thickness. Depending on the settings, the display may show other parameters. Press F4 to key to toggle between available display types For more detailed information on Measure mode, please see the full ECHO series manual

6. Changing Resolution

To change between 3 digit and 4 digit resolution, go to the Main Menu, then select initial settings, use the up or down keys to select resolution, press the F1 back button to exit the menu and return to the previous screen.



7. Changing the Parameter Settings

To change any parameter settings, press the F1 – Menu key from the Transducer selection screen. Use the up and down arrow keys to select the Display, Initial Settings, or Measurements option depending on the setting you wish to change and press the MENU/OK key. Use the arrow keys to select any of the settings you wish to change. Once you select a parameter, use the arrow keys to navigate the options. When finished, press the F1 – Back key. For more detailed information on parameter settings, please refer to the ECHO Series Manual

Note: The default setups will not be erased when assigning a new Setup File

Adjusting waveform parameters:

If your Echo is equipped with the live waveform and datalogger, in the A-scan or waveform main measurement mode, you can adjust the following parameters in real time: Initial gain I DB, Final gain Fdb, slope, rectification, range, delay, MB Blank, IF Blank, C3 Blank, Echo WindowECHO 1 Detect, ECHO 2 Detct, Pulser voltage, ID, Alarm.

Simply press the right or left arrow keys to toggle to the parameter to be adjusted then use the up or down arrow to adjust and F1 when done.

