

## ECHO Series

Hand-Held Digital Ultrasonic Corrosion/Precision Thickness Gage and Flaw Detector



- Simple to Operate
- Hand Held
- Field Upgradeable Options
- IP67 Rated
- Corrosion, Precision, and Flaw Detection Modes
- Live A-scan
- Made in the USA

# The Ultimate in Portable Ultrasonic Inspection

Our ECHO series represents a breakthrough in portable ultrasonic inspection. The ECHO series can quickly and easily switch from corrosion or precision thickness gaging, to flaw detector all offered in a rugged, custom package. The perfect size of fit and function! Hold the ECHO in your hand and you will agree no detail has been overlooked and the ergonomics are unmatched by any thickness gage in the industry! The new ECHO series comes in several configurations. ECHO 9 is our corrosion gage using dual transducers, ECHO 7 is our precision thickness gage with 1 micron resolution using single element transducers and ECHO 8 is the ultimate unit combining corrosion and precision thickness gage utilizing both dual and single element transducers. ECHO FD is our flaw detector.

ECHO series was designed specifically as a platform to allow the instrument total flexibility. What this means is you are never stuck with just a basic model, but rather, an instrument that can expand with you as your business and applications expand. The ECHO series is available in many configurations as listed in the models chart. An inspection company may be required to do every day thickness surveys requiring a live waveform and datalogger and also need to perform AWS weld inspection work; the model for you would be the ECHO 9FD allowing you to quickly and easily switch from corrosion to flaw mode in seconds. We also address a wide variety of features and budgets to meet your

every need. The platform allows for quick updating of software directly from the keypad so unlocking the unlimited potential of the ECHO platform is simply a few keystrokes away.

The ECHO series has a remarkable sunlight readable 3.5" color display, up to 32 GB of micro SD memory, built-in rechargeable high capacity Li Ion battery all packaged in a custom case designed for IP67 rating. ECHO Series can measure from 0.020" to 23" in steel in corrosion mode or as thin as 0.006" in steel when configured as a precision thickness gage.



# ECHO Thickness Gage Series Standard Features

- Compatible with a wide variety of Danatronics and common competitors dual and single element transducers
- Change color and VIBRATE on alarm (ideal for inspections in loud environments)
- 27 hour battery life with hi-capacity re-chargeable battery pack via the USB port
- Wide thickness range (0.006" to 23" depending on gage type, material and transducer)
- Inches, mm or  $\mu$ Sec
- Multiple languages
- Velocity mode
- Fast Min/Max mode to display actual thickness and minimum and maximum at the same time
- Gain, range, rectification, blank adjustments with live waveform
- Datalogger 2 GB micro SD card standard expandable to 32 GB
- Datalogger interfaces with Microsoft Excel™
- Designed for IP67
- Simple one hand operation
- Field upgradeable software options
- Made in the USA

## ECHO Series Standard Inclusions

Includes transducer (DKS537, dual 5.0 Mhz, 0.375" with potted 3 foot cable for corrosion gages; for precision gages, a probe up to 10 Mhz with a lemo to microdot cable are included), 2 GB micro SD card, Li-ion battery,

battery charger, transport case, manual with data XL, USB cable, echo-to-echo to ignore coatings. Our most advanced models include custom rubber boot.

## ECHO Series Software Options

Software options are all field upgradeable with many advantages:

- Options are activated via the keypad...no need to plug into a computer
- Only takes less than one minute
- No shipping cost
- No downtime
- Never worry about buying an obsolete unit
- Less initial outlay of capital

### Datalogger/B-scan

Internally store millions of thickness readings with ID location and send readings to Microsoft Excel via our Data XL interface program. Interfaces with Ultrapipe.

### Oxide Scale

Simultaneously displays the wall thickness of the boiler tube thickness as well as the internal oxide scale at their independent velocities. Knowing the thickness of the boiler tube can greatly improve the efficiency and extended life of the tube.

### Live Waveform

Displays the live A-scan for echo verification and real time control of range, gain, rectification and blanks.

### Corrosion Mode

Uses dual transducers to measure remaining wall thickness on primarily steel structures subject to corrosion.

### Angle Beam Software

Available on ECHO 8 and ECHO 9, displays trig functions of detected echo for angular distance, surface and depth.

*NOTE: When used as a thickness gage it is not meant to be a code compliant ultrasonic flaw detector due to vertical linearity and display update rate. See ECHO FD for more details.*

### Precision Mode

Allows for the use of single element transducers along with up to 2,700 stored application setups with 1 micron resolution (0.0001" or 0.001mm).

### Flaw Detection Mode

Code compliant ultrasonic flaw detector with fast, 60 Hz. Display update rate, 2 independent gates, AWS and DAC software standard.

### Floating and Tracking gates

For use as a flaw detector; this features allows the gate to float vertically from -1 to -18 dB for consistent edge depth thickness readings. Also includes tracking gate to allow for echo to echo thickness measurements.

### Bluetooth

Allows ECHO to export data such as a thickness reading or file to another device via Bluetooth (Requires external software to properly communicate).



# ECHO 9 Corrosion Thickness Gage

Our ECHO 9 is our premier corrosion thickness gage with a wide thickness range, able to be used with a variety of dual transducers as well as a selection of single element and angle beam probes. Similar to our precision thickness gages, ECHO 9 can save and store 2,700 custom setups.

## Typical Applications

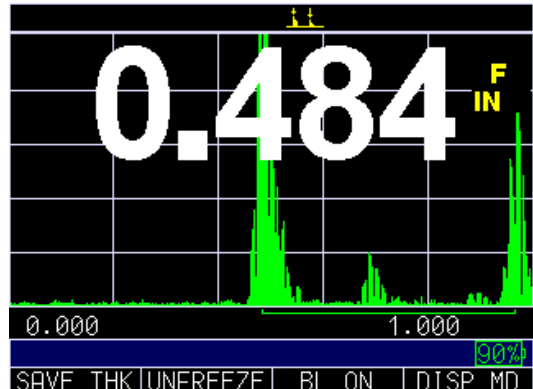
- Boiler tubes
- Pressure vessels
- Storage tanks
- Ship hulls
- Pipes
- Steel beams on bridges

## Standard Features

- Compatible with a wide variety of Danatronics dual and single element transducers
- Wide thickness range (.020" to 23" depending on gage type, material and transducer)
- Coating Thickness and substrate thickness displayed simultaneously on gage with live waveform using standard dual transducers
- High temperature probes available up to 950F/509C (intermittent use)
- Temperature correction
- File compare features shows old readings along with new readings for datalogger versions (real-time corrosion monitor)
- Available angle beam option
- Gridview
- Password lock
- Supervisor and other locks
- 2,700 stored setups
- Change color and vibrate on alarm



ECHO 9 – Base model includes Echo to Echo



ECHO 9W – Includes Waveform, Coating Thickness, Temperature Correction



ECHO 9DL – Includes Datalogger, B-scan, Temperature Correction. Gridview A-scan shown above.



ECHO 9DLW – Includes Waveform, Datalogger, B-scan, Coating Thickness, Temperature Correction, Rubber Boot

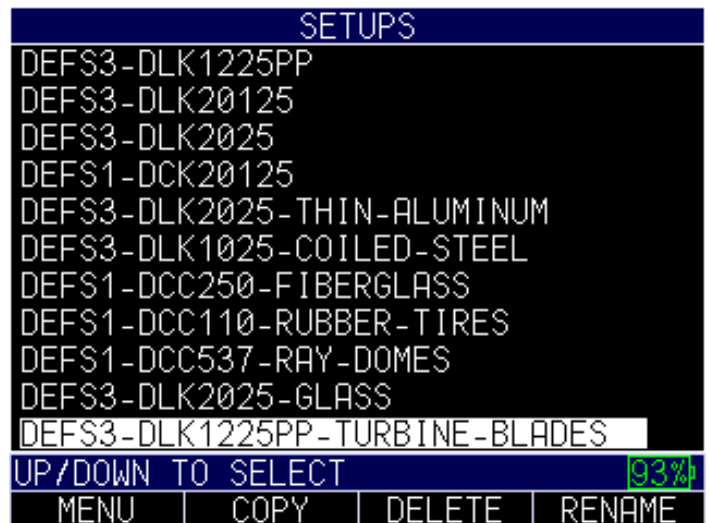
# ECHO 7 Precision Thickness Gage

ECHO 7 precision hand-held ultrasonic thickness gages are designed for use with single element contact, delay line and immersion transducers to provide a wide thickness range and up to 1 micron resolution. ECHO 7 can save up to 2,700 custom applications setups allowing the operator to quickly and easily switch transducers and setups on the fly for unique and separate tasks.



## Standard Features

- 0.006-23" range in steel
- 1 micron resolution (0.0001" or 0.001 mm)
- Single element, contact, delay line and immersion transducers (1-30 MHz)
- Store and recall up to 2,700 setups
- Multiple modes for challenging applications
- 30 Mhz bandwidth
- Square wave Pulser
- Zoom Auto Tracking
- Auto Phase Reversal Detection with alarm
- Supervisor and other locks



2,700 stored custom application setups.

## Typical Applications

- Castings
- Turbine blades and wax molds
- Plastic parts including bottles, pipes, trays and toys
- Coil steel and automotive body panels
- Fiberglass and gel coatings
- Velocity verification for ductile and gray iron (Velocimeter)
- Aluminum, glass, ceramics, zinc, and more





# ECHO 8 Corrosion and Precision Thickness Gage

ECHO 8 represents our most capable ultrasonic thickness gage combining both corrosion and precision thickness into one small instrument. Quickly switch transducers and “gage type” to essentially non-destructively measure any engineered material. The ECHO series can keep track of up to 2,700 stored setups, so switching from materials with different thicknesses and alarm values is simple.

## Typical Applications

- Inspection Companies—all-purpose gage for measuring any engineered material thickness
- Airplane Inspection (thin aluminum, plastic windows, and rubber tires)
- Marine Surveyors (fiberglass & steel)



ECHO series in split screen A and B-Scan with optional EZ-Scan 6 magnetic wheel encoder

## Standard Features

- Includes all features from the ECHO 7 and ECHO 9
- Switch from dual to single element transducers
- Switch resolution from .01” to .001” to .0001”
- Store and recall up to 2,700 applications setups
- Rechargeable batteries good for more than 24 hr.
- ECHO 8DLW includes custom rubber boot with stand



# ECHO FD Flaw Detector

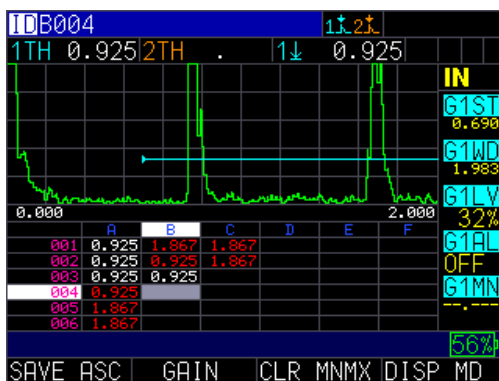


ECHO FD is the ideal instrument for portable applications such as rope access, storage tanks and bridges. ECHO FD offers the most ergonomically balanced unit on the market today allowing for easy left or right hand use with just one thumb to access all keys. Even operating the unit in complete darkness is simple. We are also the only manufacturer to offer changing of color while

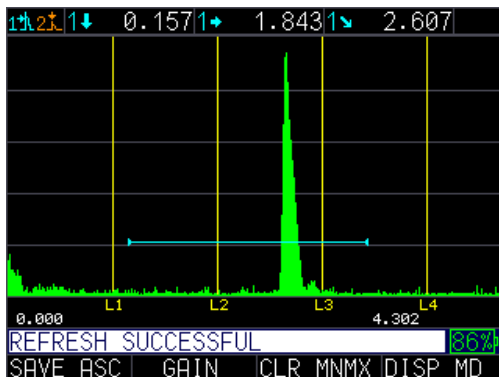
vibration on alarm for operation in loud environments.

The ECHO, when in flaw detection mode, is an everyday instrument capable of performing a wide variety of ultrasonic tests. You will be amazed at the many included standard features such as 2 independent gates, fast-60 Hz. display update rate, DAC, AWS, B-scan, Grid View and 2 GB of micro SD card memory as well as internal memory are all standard. Best of all, ECHO FD is designed and made in the USA so full factory support is only a call or click away.

ECHO FD offers a wide variety of unique and easy to use software features such as Grid View, Peak Pitch Memory, supervisor lock, floating and tracking gate, leg indicator, auto 80 FSH, triple DAC, 13 hour battery life,\* AWS software, Reference Gain, echo to echo and Grid View to view A-scan and grid simultaneously.



Grid view



Leg indicator

## Standard Features

- Peak Pitch Memory – changes the audible chirp when a probe's peak signal is determined
- Supervisor lock – allows the ability to lock parameters with a password to prevent accidental changes
- Floating and tracking gates – see software options
- Custom color pallet – allows changes to text, grid, background and more for easy viewing
- Auto 80, automatically places signal within the gate to 80 Full Screen Height (FSH)
- Triple DAC, allow the simple creation and storage of single, triple and Japanese (JIS) DAC curves
- Continuous 13 hour battery life under factory default settings
- AWS software, displays the D-rating along with A and C values in the 3 measurement boxes
- Reference gain...includes dB step to quickly add or subtract scanning gain such as 2 or 6 dB
- Echo to echo, ideal for measuring painted parts

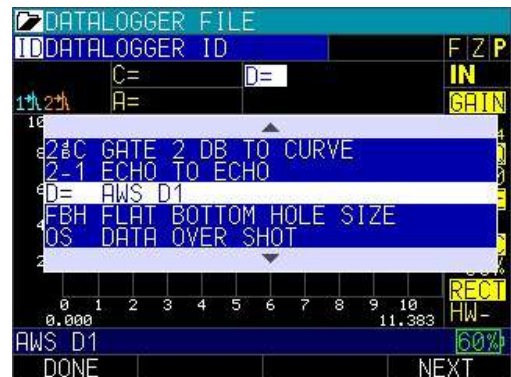
## Additional Options

**Floating gate:** allows for 60 Hz. update rate while maintaining consistent thickness readings while floating the gate. This feature also includes tracking gate for echo to echo thickness readings as well as V-path correction for a variety of dual transducers.

**Bluetooth:** allows Bluetooth interface with Bluetooth devices set up to interface with ECHO.



ASME DAC-3



AWS D-rating

\*Battery life is 13 hours in flaw detection mode due to 60 Hz update rate.



# Environmentally Tough, Ergonomically Superior!



## Environmentally Tough!

The ECHO series was designed from the ground up. With more than 85 combined years in designing, manufacturing and using hand held ultrasonic thickness gages, Danatronics left no detail uncovered. From its new case designed for IP67, to its easy to read sunlight readable 3.5" color display, you will find the ECHO series combines practical features with a simple, clean design built for years of field service and durability.

## Ergonomically Superior!

With its new 3.5" sunlight readable display, The ECHO series offers many display formats to suit any age operator and reduce fatigue. So whether you want to view the largest possible numbers or would prefer more text on screen, ECHO has you covered.

ECHO is also perfectly balanced and makes holding it in one hand possible and simple, all keys can be reached you're your thumb...no clumsy joy sticks or second functions needed. There is even a world's first vibrate on alarm to inform the operator any pre-set thickness threshold has been tripped which is great for tired operators and testing in loud environments.



## Hardware Options

- Rubber boot with built-in finger strap and bail (stand)
- Chest harness for rope access
- Magnetic wheel encoder
- Footswitch
- Remote power bank
- Magnetic pipe stand
- Heavy duty bail with variable angle adjustment and anti-slip base
- RS-232
- Bluetooth



Heavy duty bail



Chest harness for rope access



Magnetic pipe stand

## Data XL and Data XL PRO

At Danatronics we believe managing your saved data should be simple. As such, we include with every thickness gage a free interface program we call Data XL. Data XL saves readings to .csv files that can be used in any spreadsheet program such as Microsoft Excel or Google Sheets.

Here are some advantages:

- Write custom batch programs
- Simple double click the file to be transfer and Microsoft Excel™ with all i.d.'s and readings are displayed
- Create file and send them to the ECHO
- Merge files using Data XL
- Saved stored application setups can be sent to the ECHO or multiple ECHO units to ensure reliability and repeatability
- Update firmware (latest version of operating software is available on the support tab of [www.danatronics.com](http://www.danatronics.com))
- Send Bit Maps (screen shots) to further document your inspections

## Ultrapipe Interface

Echo interfaces with Ultrapipe and PSAIM software from Siemens.



# Danatronics Transducers

The ECHO series comes loaded with a default list of probes to solve a vast variety of applications for any non-destructive testing wall thickness of most engineering materials.

So, if you are measuring, boiler tubes, pressure vessels, ship hulls, bridges, coil steel, aluminum, plastic bottles, toys, trays and anything in between...we have the probe for you.

## Dual Transducers

### Standard Dual Transducers

ECHO Model	Part No.	Range in Steel	Echo to Echo Range** in Steel	Freq.	Diameter	Temperature Range	Connector Type
8, 9	DK-250	0.100"-20" (2.5mm-508mm)	0.200"-2" (5.08mm-50.8mm)	2.25 MHz	0.500"/12.7mm	32-392F/0-200C	Right Angle Potted - Lemo 00
8, 9	DK-525	0.040"-20" (1mm-508mm)	0.080"-2" (2mm-50.8mm)	5.0 MHz	0.250"/6.35mm	32-392F/0-200C	Right Angle Potted - Lemo 00
8, 9	DK-537	0.040"-20" (1mm-508mm)	0.080"-2" (2mm-50.8mm)	5.0 MHz	0.375"/9.52mm	32-130F/0-54C	Right Angle Potted - Lemo 00
8, 9	DKS-537	0.040"-20" (1mm-508mm)	0.100"-0.750" (2.54mm-19.05mm)	5.0 MHz	0.375"/9.52mm	32-130F/0-38C	Right Angle Potted - Lemo 00
8, 9	DK-550	0.040"-20" (0.76mm-508mm)	0.080"-2" (2mm-50.8mm)	5.0 MHz	0.500"/12.7mm	32-392F/0-200C	Right Angle Potted - Lemo 00
8, 9	DK-718	0.030"-2" (0.76mm-50.8mm)	0.060"-1" (1.52mm-25.4mm)	7.5 MHz	0.187"/4.75mm	32-130F/0-54C	Right Angle Potted - Lemo 00
8, 9	DK-718LPM*	0.050"-2" (1.25mm-50.8mm)	N/A	7.5 MHz	0.187"/4.75mm	32-392F/0-200C	Right Angle Potted - Lemo 00
8, 9	DK-1025	0.030"-2" (0.76mm-50.8mm)	N/A	10.0 MHz	0.250"/6.35mm	32-392F/0-200C	Right Angle Potted - Lemo 00

\*LPM = Low Profile Mini; probe height 16mm, top dia. 12mm

\*\*In Echo to Echo Mode recommended to use gage with live waveform (A-scan)

### Composite Dual Transducers

ECHO Model	Part No.	Range in Steel	Echo to Echo Range in Steel	Freq.	Diameter	Temperature Range	Connector Type
8, 9	DC-110	0.200"-20" (5.08mm-508mm)	N/A	1.0 MHz	1"/25.4mm	10-160F/-12-70C	Right Angle Potted - Lemo 00
8, 9	DC-175	0.150"-20" (3.81mm-508mm)	N/A	1.0 MHz	0.750"/19.05mm	10-160F/-12-70C	Right Angle Potted - Lemo 00
8, 9	DC-250	0.100"-20" (2.5mm-508mm)	0.200"-2" (5.08mm-50.8mm)	2.25 MHz	0.500"/12.7mm	10-160F/-12-70C	Right Angle Potted - Lemo 00
8, 9	DC-525	0.040"-20" (1mm-508mm)	0.080"-2" (2mm-50.8mm)	5.0 MHz	0.250"/6.35mm	10-160F/-12-70C	Right Angle Potted - Lemo 00
8, 9	DC-537	0.040"-20" (1mm-508mm)	0.080"-2" (2mm-50.8mm)	5.0 MHz	0.375"/9.52mm	10-160F/-12-70C	Right Angle Potted - Lemo 00
8, 9	DC-550	0.040"-20" (1mm-508mm)	0.080"-2" (2mm-50.8mm)	5.0 MHz	0.500"/12.7mm	10-160F/-12-70C	Right Angle Potted - Lemo 00

### Dual Echo To Echo Transducers

ECHO Model	Part No.	Range in Steel	Echo to Echo Range in Steel	Freq.	Diameter	Temperature Range	Connector Type
8, 9	DK-537EE	0.040"-20" (1mm-508mm)	0.080"-1.5" (2mm-38.1mm)	5.0 MHz	0.375"/9.52mm	32-130F/0-54C	Right Angle Potted - Lemo 00
8, 9	DK-718EE	0.030"-1.5" (0.76mm-38.1mm)	0.060"-1.0" (1.5mm-25.4mm)	7.5 MHz	0.187"/4.75mm	32-130F/0-54C	Right Angle Potted - Lemo 00

### Dual High Temp Transducers

ECHO Model	Part No.	Range in Steel	Echo to Echo Range in Steel	Freq.	Diameter	Temperature Range	Connector Type
8, 9	DHT-537	0.040"-20" (1mm-508mm)	0.080"-2" (2mm-50.8mm)	5.0 MHz	0.375"/9.52mm	-5 to 950F -20 to 509C	Straight Microdot requires detachable cable
8, 9	DHT-537RM	0.040"-20" (1mm-508mm)	0.080"-2" (2mm-50.8mm)	5.0 MHz	0.375"/9.52mm	-5 to 950F -20 to 509C	Right Angle Microdot requires detachable cable

### Quick Change Composite Element Angle Beam Transducers

Available in: Diameter: 1/4", 3/8" & 1/2"; Frequencies: 1.0, 2.25, 3.5, 5.0, 7.5 & 10.0 MHz; Standard Wedges: 30°, 45°, 60°, 70°



# Danatronics Transducers

## Contact Transducers

### Standard Contact

ECHO Model	Part No.	Range in Steel Class 1	Range in Steel Class 2	Range in Steel Class 3	Range in Plastic	Freq.	Diameter	Temperature Range	Connector Type*
7, 8	DCK-250	0.100"-20" (2.54mm-508mm)	n/a	n/a	n/a	2.25 MHz	0.500" 12.7mm	32-392F 0-200C	Right Angle Microdot
7, 8	DCK-525	0.040"-20" (1mm-508mm)	n/a	n/a	n/a	5.0 MHz	0.250" 6.35mm	32-392F 0-200C	Right Angle Microdot
7, 8	DCK-537	0.040"-20" (1mm-508mm)	n/a	n/a	n/a	5.0 MHz	0.375" 9.52mm	32-392F 0-200C	Right Angle Microdot
7, 8	DCK-550	0.080"-20" (2mm - 508mm)	n/a	n/a	n/a	5.0 MHz	0.500" 12.7mm	32-392F 0-200C	Right Angle Microdot
7, 8	DCK-718	0.030"-10" (0.76mm - 254mm)	n/a	n/a	n/a	7.5 MHz	0.187" 4.75mm	32-392F 0-200C	Right Angle Microdot
7, 8	DCK-1025	0.030"-2" (0.76mm - 50.8mm)	n/a	n/a	n/a	10.0 MHz	0.25" 6.35mm	32-392F 0-200C	Right Angle Microdot
7, 8	DCK-1025HR	0.030"-1" (0.76mm - 25.4mm)	n/a	n/a	n/a	10.0 MHz	0.25" 6.35mm	32-392F 0-200C	Right Angle Microdot
7, 8	DCK-20125	0.025"-0.75" (0.4mm - 25.4mm)	n/a	n/a	n/a	20.0 MHz	0.125" 3.175mm	32-392F 0-200C	Right Angle Microdot

### Contact Composite

ECHO Model	Part No.	Range in Steel Class 1	Range in Steel Class 2	Range in Steel Class 3	Range in Plastic	Freq.	Diameter	Temperature Range	Connector Type*
7, 8	DCC-110	0.300"-20" (7.62mm - 508mm)	n/a	n/a	n/a	1.0 MHz	1" 25.4mm	10-160F -12-70C	Right Angle Microdot
7, 8	DCC-175	0.300"-20" (7.62mm - 508mm)	n/a	n/a	n/a	1.0 MHz	0.750" 19.05mm	10-160F -12-70C	Right Angle Microdot
7, 8	DCC-250	0.100"-20" (2.54 - 508mm)	n/a	n/a	n/a	2.25.0 MHz	0.500" 12.7mm	10-160F -12-70C	Right Angle Microdot
7, 8	DCC-537	0.040"-20" (1mm-508mm)	n/a	n/a	n/a	5.0 MHz	0.375" 9.52mm	10-160F -12-70C	Right Angle Microdot

## Delay Line Transducers

### Delay Line Standard

ECHO Model	Part No.	Range in Steel Corrosion Mode	Range in Steel Class 2	Range in Steel Class 3	Echo to Echo Range in Steel	Range in Plastic	Freq.	Diameter	Temperature Range	Connector Type*
7, 8, 9	DLK-525	0.080"-0.750" (2mm-19mm)	0.025-0.500" (6.35mm - 12.7mm)	0.020"-0.375" (0.5mm - 9.5mm)	0.025" - 0.400" (0.635mm-10.16mm)	0.010"- 0.150" (0.254mm - 3.81mm)	5.0 MHz	0.25" 6.35mm	32-122F 0-50C	Right Angle Microdot
7, 8, 9	DLK-1025	0.080"-0.750" (2mm-19mm)	0.020"-0.500" (0.5mm - 12.7mm)	0.015"-0.375" (0.38mm - 9.5mm)	0.025" - 0.400" (0.635mm-10.16mm)	0.010"-0.150" (0.254mm - 3.81mm)	10.0 MHz	0.25" 6.35mm	32-122F 0-50C	Right Angle Microdot
7, 8, 9	DLK-1525PP-SM	0.080"-0.300" (2mm-7.62mm)	0.020"-0.200" (0.5mm - 5.08mm)	0.015"-0.125" (0.38mm - 5.08mm)	0.020" - 0.200" (0.508mm-5.08mm)	0.015"-0.060" (0.15mm - 1.52mm)	15.0 MHz	0.080" 2mm (tip dia)	32-122F 0-50C	Straight Microdot
7, 8, 9	DLK-1525PP-RM	0.080"-0.300" (2mm-7.62mm)	0.020"-0.200" (0.5mm - 5.08mm)	0.015"-0.125" (0.38mm - 5.08mm)	0.020" - 0.200" (0.508mm-5.08mm)	0.015"-0.060" (0.15mm - 1.52mm)	15.0 MHz	0.080" 2mm (tip dia)	32-122F 0-50C	Right Angle Microdot
7, 8	DLK-2025	n/a	0.015"-0.300" (3.81mm - 7.62mm)	0.006"-0.200" (0.152mm- 7.62mm)	n/a	0.003"-0.100" (0.076mm - 2.54mm)	20 MHz	0.25" 6.35mm	32-122F 0-50C	Right Angle Microdot
7, 8	DLK-20125	n/a	0.015"-0.200" (3.81mm - 7.62mm)	0.006"-0.200" (0.152mm- 7.62mm)	n/a	0.003"-0.100" (0.076mm - 2.54mm)	20 MHz	0.125" 3.175mm	32-122F 0-50C	Right Angle Microdot

### Delay Line Composite

ECHO Model	Part No.	Range in Steel Class 1	Range in Steel Class 2	Range in Steel Class 3	Range in Plastic	Freq.	Diameter	Temperature Range	Connector Type*
7, 8	DLC-525	n/a	0.040"-0.500" (1mm - 12.7mm)	0.030"-0.375" (0.762mm-9.5mm)	0.020"-0.200" (0.5mm - 5.08mm)	5.0 MHz	0.375" 9.52mm	32-122F 0-50C	Right Angle Microdot



\*Right Angle Microdot - requires additional cable

# Specifications

## GENERAL

**Size:** Length 7.25" x Width 4.00" x Height 2.00" (184mm x 101.6mm x 50.8mm)

**Weight:** 1.15 lbs (.52 kg) with internal Li-Ion battery, 1.0 lb. (.45 kg) with optional Alkaline tray including 3 AA batteries

**Temperature (Gage Operating):** -4 to 122F (-20 to 50C)

**Package:** Designed for IP67 rating, custom, splash-proof, high impact plastic with illuminating rubber keypad for go/no-go testing

**Transducer Connector Type:** Lemo 00 (2 qty)

**Bandwidth:** 0.5-30 Mhz (-3dB) Measurement Rate: 4 Hz or 25 Hz. Pulser: 150V, Square Wave

**Range:** Thickness range depends on gage type, probe selection and material conditions. Typical range in corrosion mode, 0.020-23" (0.076 - 584 mm). Typical range in precision mode, 0.006-23" (0.152 -584 mm) in steel, as low as 0.003" (0.076 mm) in plastic

**Calibration:** Cal zero, Cal velocity, Two-point calibration or Auto Calibration performs a two-point calibration using a 5-step test block

**Material Velocity Range:** 0.0200 in/usec-0.7362 in/  $\mu$ S (0.508-18.699 mm/  $\mu$ S)

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

**Batteries:** Standard 3.7 V Li Ion internally rechargeable battery (11-27 hours; Standard mode of 4Hz and 74% brightness: 27 hour continuous operation, Fast mode at 25Hz, continuous measurements in echo to echo mode: 11 hours; flaw detection mode: 13 hours) or optional alkaline tray for 3 AA batteries (3 hours)

**Shut Off:** selectable auto shut off 1-31 min. or never shut off

**Transport case:** Hard Plastic with high density molded foam cut out for gage and most accessories

**Certifications:** CE certified, RHOS compliant, designed for IP67, NIST traceable calibration certificate included with gage

**Standard Inclusions:** ECHO series ultrasonic thickness gage, a transducer (ECHO 9 - DKS-537, ECHO 7,8 - choice of transducer up to 10mhz), transducer cable, 2oz bottle of couplant, operation manual, Data XL interface program, USB cable, Charger Adapter, Transport Case. A transducer is included with each model. Contact Danatronics for details based on exact inclusion per model.

**Warranty:** Limited 2 year warranty under normal use on parts and labor for gage. Optional Dan-A-Care to add up to 3 more years

## DISPLAY

**Display:** 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.

## DATALOGGER

**Memory:** Internal memory for stored setups standard on all models. For Datalogger models 2 GB micro SD card standard and expandable up to 32 GB

**Stored Application Setups:** Storage and recall of 2,700 calibration and set up files

**Data XL:** Interface program to send and receive stored readings, latest firmware and application set up files as two way communication from ECHO to computer (Excel). Saved readings are .csv files and directly interfaces with Microsoft Excel.™

**USB:** USB 2.0

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## MEASUREMENTS

**Gain:** Low, Standard, High, and Automatic Gain Control (AGC). 20-94 dB in 1 dB increments for gages with waveform.

**Zoom:** Automatically centers echos in the center of the display independent of material thickness

**Units:** English, Metric, Microseconds

**Fast Min/Max:** Displays minimum and maximum simultaneously with actual thickness at 25 Hz.

**Alarms:** Gage beeps and display changes color based on alarm condition

**Vibrate:** Gage can be set to vibrate on alarm (ideal for loud environments)

**Transducers:** Single, dual, delay lines, immersion, contact, angle beam (depends on gage type)

**ECHO 9 Measurement Types:** ECHO 9 corrosion gage: Main bang to first backwall echo, echo to echo and velocity mode (displays acoustic sound speed based on entered thickness)

**ECHO 7 & 8 Measurement Types:** A precision gage: Class 1, Main bang to first back wall echo, Class 2, Interface echo to first backwall and Class 3, echo to echo after interface echo... Class 2 and 3 use high frequency single element delay lines or immersion probes, velocity mode (displays acoustic sound speed based on entered thickness)

**Freeze Mode:** Direct access to freeze display (ideal for high temperature applications)

**Hold Mode:** Holds display to retain last thickness reading

**Differential Mode:** Displays the difference from actual thickness measurement in absolute or percentage of a user entered reference value

**Resolution:** 0.001" or 0.010" (0.01mm or 0.1mm) as corrosion gage and 0.0001" or 0.001" (0.001mm or .01mm) as a precision gage

## Flaw Detector Specifications

60 Hz. Update rate, 2 independent gates, A and B-scan, data-logger with 2 GB micro SD card, interface to Excel via Data XL, 13 Hour battery life, AWS and DAC software included along with rubber boot with stand.

**ECHO-MBH:** Magnetic ball head/pipe stand for ECHO series (attaches to 1/4x20 standard connection point on the back of the unit)

**ECHO RB:** Rubber boot available with padded wrist strap, 4 point chest harness, chest harness, built in bail (stand) with locking position and finger strap for easy one hand operation. ECHO RB is included with ECHO 7,8 or 9 as DLW models

**ECHO-ABP:** Alkaline Battery Pack (3- AA) for ECHO series. Battery life 3 hours

**ECHO-RPP:** Remote Power Pack plugs into USB port to provide power/recharge to ECHO series

**ECHO-HDB:** Heavy Duty bail with variable angle adjustment and anti-slip base

## HARDWARE/SOFTWARE

**Hardware Options:** EZ Scan B-Scan encoder, Bluetooth, foot switch, RS232

**Field Upgradeable Software Options:** Datalogger with B-scan, Live waveform, Precision mode, Corrosion mode, Oxide scale, Angle Beam

**Data XL Pro Software:** allows sending of A and B-scan images to computer for advanced reporting



Item	Specification	ECHO 9 Corrosion Gage				ECHO 7 Precision Gage				ECHO 8 Corrosion & Precision Gage				ECHO FD Flaw Detector			
		9	9W	9 DL	9 DLW	7	7W	7 DL	7 DLW	8	8W	8 DL	8 DLW	FD	9FD	7FD	8FD
Scan Mode	4 or 25 Hz. displays actual and min or max at same time	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	/	/	/	/
Datalogger	Internal and micro sd card based datalogger with linear, 2D, 3D boiler and some with custom points (interfaces with Excel)	0	0	✓	✓	0	0	✓	✓	0	0	✓	✓	✓	✓	✓	✓
Memory	Internal memory, 2 GB standard, expandable to 32 GB micro sd card	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Flaw Detector	Ultrasonic flaw detector: 60 Hz, update rate, 2 gates, aws code, dac, datalogger, manual B-scan	0	0	0	0	0	0	0	0	0	0	0	0	✓	✓	✓	✓
Corrosion Thickness Gage	Ultrasonic corrosion gage using primarily dual probes, A and B-scan, echo to echo, datalogger	✓	✓	✓	✓	0	0	0	0	✓	✓	✓	✓	0	✓	0	0
Precision Thickness Gage	Ultrasonic precision gage (1 micron resolution) using single element probes, A and B-scan, echo to echo, datalogger	0	0	0	0	✓	✓	✓	✓	✓	✓	✓	✓	0	0	✓	0
Disply Update	Fast 60 Hz update rate	0	0	0	0	0	0	0	0	0	0	0	0	✓	✓	✓	✓
DAC	Distance Amplitude Correction (DAC), ASME, ASME 3, JIS and Custom	0	0	0	0	0	0	0	0	0	0	0	0	✓	✓	✓	✓
AWS	Ameican Welding Society (AWS) code for D rating	0	0	0	0	0	0	0	0	0	0	0	0	✓	✓	✓	✓
Floating and Tracking Gates	Floats gate at -1 to -18dB for cosistent, 60 Hz update rate edge depth thickness readings, includes tracking gate for echo to echo readings	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Auto 80	Automatically adjusts echo to 80 Full Screen Height (FSH) for gate 1	0	0	0	0	0	0	0	0	0	0	0	0	✓	✓	✓	✓
Peak Pitch Memory	Variable Chirp of gate 1 signal in peak hold for peaking signlas as an audible indicator	0	0	0	0	0	0	0	0	0	0	0	0	✓	✓	✓	✓
Echo to Echo	Measures the metal thickness only (ignores paint and coatings)	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Range	Adjustment of manual range control or auto zoom tracking to center echos independent of selected range	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	N/A	N/A	N/A	N/A
Recitification	RF, Half Wave Positive, Half Wave Negative and Full Wave Rectification	0	✓	0	✓	0	✓	0	✓	0	✓	0	✓	✓	✓	✓	✓
Live Waveform (A-scan)	Full Adjustments, for gain in 1dB step or AGC, main bang blank, blank after first received echo, range including zoom auto tracking to center echos independent of material rectification	0	✓	0	✓	0	✓	0	✓	0	✓	0	✓	✓	✓	✓	✓
B-scan (Non-encoded)	Displays a cross section of the test piece	0	0	✓	✓	0	0	✓	✓	0	0	✓	✓	✓	✓	✓	✓
B-scan (Encoded)	Displays a cross section of the test piece using the EZ Scan magnetic wheel linear access encoder	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Temperature Correction	Corrects thickness value for sound speed difference at elevated temperatures	0	✓	✓	✓	0	✓	✓	✓	0	✓	✓	✓	0	0	0	0
Coating Thickness	Displays coating and substrate thicknesses simultaneously	0	✓	✓	✓	0	✓	✓	✓	0	✓	✓	✓	0	0	0	0
Oxide Scale	Simultaneously displays the thickness of the oxide layer and boiler tube thickness	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Auto Phase Reversal with Alarm	Automatically can alarm on a phase change in RF mode	0	0	0	0	0	✓	0	✓	0	✓	0	✓	0	0	✓	✓

0 = Software Options that are field upgradeable. Encoded B-scan requires additional hardware modifications.



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