

# FX70-DL Series

## Flaw Detector & Thickness Gauge

### Flaw Detector:

- Sizing Toolkits: DAC, AWS, TCG, DGS
- Exceptional visibility in sunlight (AMOLED) color VGA display (320x240 pixels)
- P.R.F. - 8 Hz to 2 kHz, adjustable
- Screen Refresh Rate: 60 Hz
- Detection: Z-Cross, Flank & Peak

### Thickness Gauge:

- Automatic: probe zero, probe recognition, and Temperature compensation
- Measurement: Variety of modes to address a number of applications
- Large data storage with multiple formats: Alpha numeric grid and sequential w/auto identifier
- Up to 12 hours of battery life using 3 AA cells

### Other:

- PC & OSX reporting software



# FX70-DL Series Flaw Detectors & Thickness Gauge



The Dakota Ultrasonics model **FX70-DL** is both a **flaw detector** and an **ultrasonic material and coating thickness gauge**.

The FX70-DL Flaw detectors are designed to detect, size, position, and differentiate between flaw types in various materials and welded joints. Fast & High performance, with a 200 volt square wave pulser that can be adjusted for specific applications and transducers offers greater penetration for difficult material types, or increased resolution on noisy materials. The **FX70-DL** is equipped with an adjustable pulse repetition rate of 8 to 333Hz to control how fast the pulser is firing. Therefore, when scanning at higher speeds, a higher repetition rate will make the alarm trigger more responsive.

In addition, the FX70-DL serves the function of a thickness gauge are specifically setup to very accurately measure thickness, locate pits, flaws and blind surface corrosion and measure coating thickness.

## SPECIFICATIONS

### General

**Size:** 2.5W x 6.5H x 1.24D in (63.5 x 165 x 1.5mm).

**Weight:** 14 ounces (.397kgs), with batteries.

**Case:** Extruded aluminum body with nickel plated aluminum end caps (gasket sealed).

**Display:** 1/4 VGA AMOLED color display (320 x 240 pixels). Viewable area 1.7 x 2.27 in (43.2 x 57.6 mm). 16 color palette, multiple color options, and variable brightness.

**Screen Refresh Rate:** 60Hz.

**Display Views:** Flaw Detector: Full wave, +/- Rectified, or RF. Thickness Gauge: Digits, +/- Rectified, RF, or B-Scan.

**Resolution (selectable):** +/- 0.001 in (0.01 mm) or +/- 0.0001 in (0.001mm).

**Timing:** Precision TCXO timing with single shot 100 MHz 8 bit ultra low power digitizer.

**Measurement Gates:** Two independent gates (Flaw), and three gates (thickness). Start & width adjustable over full range. Amplitude 5-95%, 1% steps. Positive or negative triggering for each gate with audible and visual alarms.

**Operating Temperature:** 14 to 140F (-10C to 60C).

**Environmental:** Meets IP65 requirements.

### Calibration

**Automatic Calibration:** Longitudinal (straight), or Shear (angle).

**Probe Types:** Single Contact, Dual, Delay, and Angle.

**Units:** English (in), Metric (mm).

**Velocity:** 0.0100 to .6300 in/ $\mu$ s (256–16,000 m/s).

**Test Range:** 0.007 in (.178mm) to 1200 in (30,480mm) maximum at steel velocity. Continuously variable.

**Zero Offset (Probe Zero):** 0–999.999  $\mu$ s.

**Material Velocity Table:** Contains longitudinal and shear velocities for a variety of material types.

### Pulser

**Pulser Type:** Two adjustable square wave pulsers and receivers.

**P.R.F.:** 8 to 2000Hz in selectable steps (8, 16, 32, 66, 125, 250, 333, 1000, 2000Hz).

**Pulser Voltage:** 100-200 volt peak amplitude, rise/fall time < 10ns into 50ohm.

**Pulse Width:** 40 to 400 ns. Selectable step options 40, 80 & 400 ns (labeled spike, thin & wide).

### Receiver

**Gain:** 0 to 110dB with 0.2dB resolution. Manual and AGC control.

**Damping:** 50, 75, 100, 300, 600, & 1500 ohms.

**Frequency Bands:** FX70-DL & FX71-DL: Broadband 1.8 - 19 MHz (-3dB). DFX-7+: Three narrow bands at 2MHz, 5MHz, 10MHz.

**Horizontal Linearity:** +/- 0.4% FSW.

**Vertical Linearity:** +/- 1% FSH.

**Amplifier Linearity:** +/- 1 dB.

**Amplitude Measurement:** 0 to 100% FSH, with 1% resolution.

**Delay:** 0 - 999in (25,375mm) at steel velocity.

### Flaw Detector Features

**TRIG:** Trigonometric display of beam path, depth, surface distance, and curved surface correction. Used with angle beam transducers.

**DAC:** Up to 8 points may be entered and used to digitally draw a DAC curve. Reference -2, -6, -10, (-6/-12), (-6/-14), (-2/-6/-10) dB. Amplitude displayed in %DAC, dB, or %FSH.

**AWS:** Automatic defect sizing in accordance with AWS D1.1 structural welding code.

**AVG/DGS:** Automatic defect sizing using probe data. Stores up to 64 custom setups.

**TCG:** Time corrected gain. 50 dB dynamic range, 20 dB per microsecond, up to 8 points for curve definition.

**Measurement Mode:** Pulse-Echo (P-E) range 0.025 in to 100 ft. (0.63mm to 3048 cm).

**Auto-Cal:** Provides automatic calibration with two reference points.

**Detection Modes:** Zero Crossing, Flank and Peak.

**Display Freeze:** Hold current waveform on screen.

**Peak Memory:** Captures peak signal amplitude.

**Skip Bar:** Displays skip legs in the waveform area.

### Thickness Gauge Features

**Measurement Modes (Dual & Single Element):**

**Pulse-Echo Mode (P-E)** - (Pit & Flaw Detection) range 0.025 to 96 in (0.63mm to 244 cm). **Single Contact** - 0.040 in to 100 ft. (1 mm to 3048 cm).

**Pulse-Echo Coating Mode (PECT)** - (Material, Coating, Pit & Flaw Detection): Material: 0.025 in to 96 in (0.63mm to 244 cm). Coating: 0.001 to 0.100 inches (0.01 to 2.54 millimeters).

**Pulse-Echo Temp Comp Mode (PETP)** - (Pit & Flaw Detection) Auto temperature compensation -range 0.025 in to 96 in (0.63 mm to 244 cm).

**Echo-Echo Mode (E-E)** - (Thru Paint & Coatings) range 0.050 to 4.0 inches (1.27 to 102 millimeters). **Single Delay Line** - 0.007 to 1.00 in (.178 to 25.4 mm). **Single Contact** - 0.040 in to 10 ft. (1 mm to 305 cm). Will vary based on coating.

**Echo-Echo Verify (E-EV)** - (Thru Paint & Coatings) range 0.050 to 1.0 inches (1.27 to 25.4 millimeters). Will vary based on coating.

**Coating Only Mode (CT)** - (Coating Thickness) range 0.0005 to 0.100 inches (0.0127 to 2.54 millimeters). Range will vary +/- depending on the coating.

One and two point calibration option for material & coating, or selection of basic material types.

Auto probe zero, recognition and temperature compensation.

High speed scan up to 50 readings per second.

Audible alarm with hi/lo limits.

Built-in differential mode for QC inspections.

Linear time dependent gain (TDG) with adjustable slope (dB per microsecond).

### Memory

**Log Formats:** Grid (Alpha Numeric), or Sequential (Auto Identifier).

**Capacity:** 4 Gb internal SD card.

**Screen Capture:** Bitmap graphic capture for quick documentation (.tif).

**Custom Setups:** 64 user configurations.

### Power Source

**Battery:** Three 1.5V alkaline, 1.2V AA Nicad cells, 1.2V AA NI-MH, or other other equivalent power source. Battery life (continuous use): Alkaline (12 hrs), Nicad (5hrs), and NI-MH (12hrs), with default settings.

**Line Power:** USB-C to PC or power outlet.

### Connections

**Output:** Direct USB-C 1.1 PC connectivity.

**Transducer Connectors:** Two LEMO 00 connectors.

### Certification

**Thickness Gauge:** Factory calibration traceable to NIST & MIL-STD-45662A.

**Flaw Detector:** EN12668-1 compliant.

### Warranty

2 year limited