

DFX-8 Series

Flaw Detector & Thickness Gauge

One on hand equals two on the job!

Flaw Detector:

- Sizing Toolkits: DAC, AWS, TCG, DGS
- Exceptional visibility in sunlight (Blanview) transmissive color QVGA display (320x240pixels)
- 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.
- Li-Ion pack up to 18 hrs, emergency backup 6 AA cells up to 12 hrs
- Windows PC interface software included
- 2 year warranty.



DFX-8 Series Flaw Detectors & Thickness Gauge



The Dakota Ultrasonics model **DFX-8** is both an **Ultrasonic flaw detector as well as an ultrasonic A/B Scan thickness scope**, in a single unit. The **DFX-8** combines the two types of gauges into one powerful and full featured instrument, that's equipped with a number of comprehensive toolkits to provide the user the arsenal necessary to address a number of common field applications. In an effort to avoid complexity issues and differential between gauges types, this manual focuses only on the flaw detector portion of the **DFX-8**. The **DFX-8** has an adjustable pulser voltage: 100, 150, and 200 volts, whereas the **DFX-8+ is a more powerful package with** special tone burst pulser for 100, 150, 200, 300, 400 volts. Both the DFX-8 and DFX-8+ feature a material and coating thickness measurement functionality allowing both material flaw and material condition assessment to be carried out.

SPECIFICATIONS

General

Size: 8.5W x 6.5H x 2.5D in (216 x 165 x 70mm).
Weight: 4.5 lbs (2.04 kgs), with batteries.
Case: Extruded aluminum body with nickel plated aluminum end caps (gasket sealed).
Display: Blanview sunlight readable QVGA TFT color display (320 x 240 pixels). Viewable area 4.54 x 3.40 in (115.2 x 86.4 mm), or 5.7 in (144.78 mm) diagonal. 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.
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.

Pulser

Pulser Type: **DFX-8** Two adjustable square wave pulsers. **DFX-8+** Two tone burst pulsers.
P.R.F.: 8 to 2000Hz in selectable steps (8, 16, 32, 66, 125, 250, 333, 1000, 2000 Hz).
Pulser Voltage: **DFX-8** 100 - 200 volt peak amplitude, rise/fall time < 10ns into 50ohm. **DFX-8+** 100 - 400v.
Pulse Width: 40 to 400 ns. Selectable step options 40, 80 & 400 ns (labeled spike, thin & wide).

Receivers

Gain: 0 to 110dB with 0.2dB resolution. Manual and AGC control.
Damping: 50, 75, 100, 300, 600, & 1500 ohms.
Frequency Bands: **DFX-8 & DFX-8+** Broadband 1.8 - 19 MHz (-3dB). Four narrow bands at 1MHz, 2MHz, 5MHz, 10MHz. **DFX-8+** Additional narrow bands at .5MHz, 15MHz.
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.

Power Source

Lithium Ion Pack: 10.8v, 2 amp hrs, typical operation 18hrs.
Battery Backup: Emergency battery backup. Six 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.

Connections

USB: Direct USB 1.1 PC connectivity.
Power Connector: 12v @ 2amps, adapter 100-240 VAC, .7 Amps, 50-60 Hz.
5 Pin Lemo (includes):
RS232Output: RS232 PC serial interface. **DFX-8+** For use with B-Scan encoders (crawlers).
Alarm Outputs: Two independent alarm outputs triggered by the gates.
Analog Out: **DFX-8+** Proportional outputs (amplitude or distance), 0-10 volts.
Transducer Connectors: Two LEMO 00 connectors.

Calibration

Automatic Calibration: Longitudinal (straight), or Shear (angle).
Probe Types: Single Contact, Dual, Delay, and Angle .
Units: English (in), Metric (mm), or Time (µs).
Velocity: 0.0100 to .6300 in/µs (256-16,000 m/s).
Test Range: 0 to 0.076in (1.93mm) minimum, to 1200in (30,480mm) maximum at steel velocity. Continuously variable.
Zero Offset (Probe Zero): 0-999.999 µs.
Material Velocity Table: Contains longitudinal and shear velocities for a variety of material types.

Memory

Log Formats: Grid (Alpha Numeric), or Sequential (Auto Identifier).
Capacity: 4 Gb internal & up to 64 Gb External SD slot.
Screen Capture: bitmap graphic capture for quick documentation.
Custom Setups: 64 user configurations.

Video

Remote Commander: Java PC software allows remote display and control for training/presentation purposes, and custom system integration.

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) measures from 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.

Flaw Detector Features (Cont'd)

Display Freeze: Holds current waveform on screen.
Peak Memory: Captures peak signal amplitude.
Auto Interface Gate - DFX-8+ Automatic adjustment of interface gate for immersion testing (water path).

Thickness Gauge Features

Measurement Modes (Dual Element):
Pulse-Echo Mode (P-E) - (Pit & Flaw Detection) measures from 0.025 in to 100 ft. (0.63mm to 3048 cm).
Pulse-Echo Coating Mode (PECT) - (Material, Coating, Pit & Flaw Detection): Material: 0.025 in to 100 ft. (0.63mm to 3048 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 -measures from 0.025 in to 100 ft. (0.63 mm to 3048 cm).
Echo-Echo Mode (E-E) - (Thru Paint & Coatings) measures from 0.050 to 4.0 inches (1.27 to 102 millimeters). Will vary based on coating.
Echo-Echo Verify (E-EV) - (Thru Paint & Coatings) measures from 0.050 to 1.0 inches (1.27 to 25.4 millimeters). Will vary based on coating.
Coating Only Mode (CT) - (Coating Thickness) Measures from 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.

64 custom setup configurations.

Transducers

Delay line: High Frequency single element delay line style for precision testing of thin materials.
Pencil: High Frequency single element delay line style for testing of materials in tight access areas and difficult geometries.
Contact: Single element contact style for general purpose longitudinal & Shear wave flaw detection.
Dual: Pitch/Catch dual element style for longitudinal & Shear wave corrosion inspections.

Certification

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

Flaw Detector: EN12668-1 compliant.

Warranty

2 year limited



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Quality Management System

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