

BT1-DL v2.0

Bolt Tension Monitor

Highlights:

- Precision TCXO timing
- Sunlight readable LCD display (240 x 160 pixels)
- Adjustable digitizer - Resolution
- Pulse-Echo measurement mode
- Temperature compensation
- Quantities - Elongation, Load, Stress, Strain and Time (nanoseconds). to the loaded waveform
- Auto Correlation - transducer placement
- Auto Calibration
- USB-C connectivity
- 4GB internal SD memory
- PC & OSX reporting software
- 2 year warranty

Ultrasonically measures the elongation produced by tightening a threaded fastener.

BT1-DL Bolt Tension Monitor



The Dakota Ultrasonics BT1-DL, Ultrasonic Bolt Tension Monitor, defines the State of the Art in the measurement of the actual clamp load produced by tightening a fastener. The BT1-DL can measure time, elongation, load, stress, or %strain in bolts of virtually any material from 1 inch to 8 feet in length, depending on the BT1-DL version. By storing the reference waveform and displaying it for comparison while the elongation is being measured, the BT1-DL minimizes operator training.

SPECIFICATIONS

Physical

Weight: 13.5 ounces (with batteries).

Size: 2.5W x 6.5H x 1.24D in (63.5 x 165 x 31.5 mm).

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

Keyboard: Membrane switch with twelve tactile keys.

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

Environmental: Meets IP65 requirements.

Connections

USB: Direct USB-C 1.1 PC connectivity. Windows & OSX interface software.

Line Power: USB-C to PC or AC adaptor.

Temperature Sensor: 5 pin Lemo 1.

Transducer Connector: Lemo 00.

Memory

Log Format: Grid (Alpha Numeric).

Capacity: 4GB internal SD memory.

Screen Capture: Tagged interface file (.tif) capture for quick documentation.

Custom Setups: 64 user configurations.

Power Source

Line Power: USB to PC or power outlet.

Batteries: Three AA cells. Alkaline 35 hrs, Nicad 10 hrs, NI-MH 35 hrs. Auto power off after 5 minutes idle. Battery status icon.

Transducers

Transducer types: Single element - 1 MHz to 10 MHz frequencies, and 1/8" to 1" diameters.

Glue-On: Available for short bolts with minimal/short elongations to eliminate transducer placement errors.

Connectors: Microdot, Lemo 00, or BNC options depending on the transducer model selected.

Custom transducers: Available for special applications.

Temperature probe: Automatic temperature compensation.

Electronics

Display: 1/8in VGA grayscale display (240 x 160 pixels); viewable area 2.4 x 1.8in (62 x 45.7mm); EL backlit (on/off/auto invert).

Screen Refresh Rate: 30 Hz.

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

Pulser Type: Square Wave.

Pulser Voltage: Selectable 100, 150 and 200 volts.

Pulse Width: Selectable options Spike, Thin, and Wide. 80 to 400 ns.

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

Frequency Band: Broadband 1.8 - 19 MHz (-3dB) filter.

Horizontal Linearity: +/- 0.4% FSW.

Vertical Linearity: +/- 1% FSH.

Amplifier Linearity: +/- 1 dB.

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

Delay: 0 - 999.9 in (25,400 mm) at steel velocity.

Measurement Gate: One gate with audible and visual alarm. Amplitude 5-95%, 1% steps.

Features

Setups: 64 custom user defined setups; factory setups can also be edited by the user.

Auto Set: Automates the detection, scope, and display setting process for each individual bolt.

Alarm Limits: Adjustable Hi/Low tolerances with visual LED's and audible beeper.

Field Calibration: Vector or Regression correction curve for increased accuracy using Load & Stress.

Display Views

A-Scan: Rectified +/- (half wave view), or RF (full waveform view).

Large Digits: Digital display only.

Alarm Limits Bar: Hi & Lo alarm limits for displaying an acceptable tolerance range.

Measuring

Units: English (in), Metric (mm), or Time (μ s). Fahrenheit or Centigrade.

Velocity: 0.0492 to .5510 in/ μ s (1250-13995 m/s).

Measurement Modes: Pulse-Echo (P-E).

Measurement Range: 1 in to 50 ft (25.4 mm to 15.24 M), dependent on material type and consistency.

Detection: Zero Crossing.

Resolution: +/- 0.00001 in (0.0001 mm).

Calibration: Automatic, Fixed, Single or Two-Point zero calibration options.

Quantities:

Time - Nanoseconds.

Elongation - Change in length (inches/millimeters).

Load - Force load applied (pounds KIP, or megapascals MPa).

Stress - Force for unit area stress applied (inches per inch or millimeters per millimeter).

%Strain - Ratio of elongation to effective length.

Bolt Materials: Select types from a preset or custom list.

Repeatability Bar Graph: Bar graph indicates stability of measurement.

Certification

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

Warranty

2 year limited



Refer pages 52 to 53 for more detail on transducer options

Made by Dakota Ultrasonics USA