

THE **MINI-MAX**

Bolt Tension Monitor

Ultrasonically measures the actual elongation produced by tightening a threaded fastener.



- ▶ The **FIRST** cost-effective ultrasonic solution available on the market.
- ▶ **EFFECTIVELY** monitor your bolts during periodic shutdowns over the service life of the fastener.
- ▶ **VISUALLY** compare the unloaded to the loaded waveform.
- ▶ **MEASUREMENT QUANTITIES** Time (nanoseconds), Elongation, Load, Stress, and %Strain.
- ▶ **DISPLAY OPTIONS**—RF, Rectified, Large Digits with Limits Bar.
- ▶ **DISPLAY RESOLUTION** 1/8 inch VGA 240 x 160 pixels.
- ▶ **STORES 8000** readings and waveforms in multiple groups.
- ▶ **BUILT-IN** linear regression or vector for optimizing load measurements.
- ▶ **AUTO SET** feature automatically optimizes detection and adjusts display.
- ▶ **HI/LO ALARM** tolerance limits work in conjunction with the data port and external pump shut-off device.

MINI-MAX SPECIFICATIONS

Physical

Size:

Width (2.5 in/63.5mm)
Height (6.5 in/165mm)
Depth (1.24 in/31.5mm)

Weight: 13.5 ounces
(with batteries)

Display:

Membrane switchpad with
twelve tactile keys.

Operating Temperature:

14°F to 140°F (-10°C to 60°C)

Case:

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

Data Output:

Bi-directional RS232 serial port.
Windows® PC interface software.

Display:

1/8 inch VGA grayscale display
(240 x 160 pixels);
Viewable area 2.4 x 1.8 inches
(62mm x 45.7mm);
EL backlit (on/off/auto)

Ultrasonic Specifications

Measurement Modes:

Pulse-Echo (standard)
Pulse-Echo w/Gate (fine adjust)

Pulser:

Square wave pulser with
adjustable pulse width
(spike, thin, wide).

Receiver:

Manual or Auto Set gain control
with 40dB range.

Timing:

10-bit 250 MHz digitizer.

Warranty

2 year limited

Power Source

Three 1.5V alkaline or
1.2V NiCad AA cells.

Typically operates for 150 hours
on alkaline and 100 hours on
NiCad (charger not included).

Auto power off if idle for 5 min.

Battery status icon.

Measuring

Range:

From 1 to 48 inches
(25.4 to 137 cm)

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)

Resolution:

+/- 0.00001 inch (0.0001 mm)

Velocity Range: 0.0492 to .3937
in/ms (1250 to 9,999 meters/sec)

Fixed, Single, and Two-point
zero calibration options.

Select bolt material types from a
preset or custom list.

Units:

English & Metric / Fahrenheit &
Centigrade.

Display

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

Large Digits—Display and toggle
between nanoseconds, elongation,
load, stress, and strain;
Digit Height: 0.400 inch (10mm).

Limits Bar (alarm limits)— Set
Hi & Lo alarm limits for displaying
an acceptable tolerance range.

Repeatability Bar Graph—
Bar graph indicates stability of
measurement.

Data Logger (Internal)

Total of 8,000 readings in multiple
bolt groups. Stores both waveform
views, nanoseconds, elongation,
load, stress and strain for each
reading.

Memory:

16 megabit non-volatile ram

Transducer

Transducer types:

Single element (1 MHz to 10 MHz
& 1/8 to 1inch diameters).

Locking quick disconnect
“00” LEMO connectors.

Standard 10 foot cable.

Custom transducers available
for special applications.

Temperature probe for automatic
temperature compensation

Features

Setups:

64 custom user defined setups;
Factory setups can also be
edited by the user.

Gate:

Gate used to fine adjust where the
detection point occurs.

Alarm Limits:

Set Hi and Lo tolerances with
audible beeper, viewable scan bar,
and visual LEDs.

Auto Set:

Locates the detection signal,
optimizes the gain setting, and
adjusts the overall display to show
the waveform and detection point
automatically.

Field Calibration:

Vector & linear regression

Certification

Factory calibration traceable to
national standards.