

## 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 1 inch 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.

A S O N A T E S T P L C G R O U P C O M P A N Y

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