

# Elcometer BG80 Bolt Tension Monitors



When nuts and bolts are fastened together under load, the action of tightening the nut increases the force applied to the bolt causing elongation.

The BG80 bolt tension monitor accurately measures this elongation, allowing the gauges to accurately measure time (nanoseconds), elongation, load, stress, and %strain of the bolt.

By using ultrasonics, bolt tension monitors are not affected by temperature, friction or resistance factors affecting the accuracy of standard torque measurement techniques - giving the BG80TDL accuracy within 0.0001mm.

Using the gauge's USB interface together with the optional shut off accessory the gauge can be programmed to automatically stop the tightening process when the appropriate load has been applied.

## Features

- Range of display & measurement options including: Elongation, Load, Stress, %Strain, RF, Rectified, Large Digits with Limits Bar
- BG80TDL features temperature compensation to counteract measurement irregularity caused by temperature change
- Data storage capability: 4GB internal memory
- Auto Set feature automatically optimizes detection and adjusts display
- Hi/Lo Alarm tolerance limits work in conjunction with the data port

## How does it work?

As a fastener is tightened it stretches (elongates) in length.

Manual torque wrenches measure the force applied when tightening a fastener, the accuracy can be affected by temperature, friction and resistance.

As BG80 & BG80TDL ultrasonically measures the change in length accurately determining the applied load of a fastener as it is tightened, they are not affected by these factors.



## Technical Specification

Model & Part Number	BG80TDL
Material thickness digits display	■
Measurement Mode <sup>1</sup>	PE
Measurement Rate:	8 readings per second
Manual:	
Measuring Range <sup>2</sup>	25.4 - 15,240mm
Measurement Accuracy <sup>2</sup>	0.0001mm
Measurement Resolution	0.001mm or 0.0001mm switchable
Velocity Calibration Range	1250 - 13995m/s
Limit alarm mode	■
Memory & Data logging	4GB internal memory, Grid format batching & Bitmap graphic capture
Calibration Options	automatic, fixed, single & 2 point
Temperature Sensor	5 pin LEMO 1
Screen Refresh Rate	30Hz
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, & 1500ohms
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	25,400mm at steel velocity
Measurement Gate	One gate with audible and visual alarm. Amplitude 5-95%, 1% steps
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
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
Units	millimetre, °C
Detection	Zero Crossing
Bolt Materials	Select types from a preset or custom list
Glue-On	Short bolts with minimal/short elongations to eliminate transducer placement errors
Transducer Probe Type	single element
Transducer Frequency Range	1 - 10MHz
Display	1/8" VGA greyscale display (240 x 160 pixels) viewable area 62 x 45.7mm
Units (selectable)	mm or inches
LED Backlight	on / off / auto
Repeatability / Stability Indicator	■
Battery Type	3 x AA alkaline
Battery Life (approximate)	Alkaline 35 hrs, Nicad 10 hrs, NI-MH 35 hrs
Low Battery Indicator	■
Battery Save Mode	auto
Operating Temperature	-10 to 60°C (14 to 140°F)
Size (w x h x d)	63.5 x 165 x 31.5mm
Weight (including batteries)	383g (13.5oz)
Aluminium case design with gasket sealed end caps, waterproof membrane keypad	■
Transducer Connector Type	LEMO
Interface	USB

<sup>1</sup> PE: Pulse-Echo Mode

<sup>2</sup> Measuring range & accuracy depends on material, surface conditions and the transducer selected

## Packing List

Elcometer BG80 Bolt Tension Monitors
Couplant
Carry Case
User Manual
Test Certificate
3 x AA Batteries
DakView Software
USB Transfer Cable

## Transducers

A complete range of magnetic Bolt Gauge Transducers for use with the BG80TDL



Part Number	Element Type	Probe Characteristic	Damping	Microdot	Top	All Metals
<b>2.25 MHz Bolt Gauge Transducers</b>						
TX2M25CM-5	Si/EI Non-Magnetic	Standard	S	■	■	■
TX2M25CM-6	Si/EI Magnetic	Standard	S	■	■	■
TX2M25DM	Si/EI Magnetic	Standard	S	■	■	■
TX2M25EM-5	Si/EI Non-Magnetic	Standard	S	■	■	■
TX2M25EM-6	Si/EI Magnetic	Standard	S	■	■	■
TX2M25GM	Si/EI Magnetic	Standard	S	■	■	■
<b>5.00 MHz Bolt Gauge Transducers</b>						
TX5M00AM-2	Si/EI Non-Magnetic	Standard	S	■	■	■
TX5M00AM-3	Si/EI Magnetic	Standard	S	■	■	■
TX5M00CM-7	Si/EI Non-Magnetic	Standard	S	■	■	■
TX5M00CM-8	Si/EI Magnetic	Standard	S	■	■	■
TX5M00DM	Si/EI Magnetic	Standard	S	■	■	■
TX5M00EM-7	Si/EI Magnetic	Standard	S	■	■	■
TX5M00EM-6	Si/EI Non-Magnetic	Standard	S	■	■	■
TX5M00GM	Si/EI Magnetic	Standard	S	■	■	■
<b>10.00 MHz Bolt Gauge Transducers</b>						
TX10M0AM-2	Si/EI Non-Magnetic	Standard	S	■	■	■
TX10M0AM-3	Si/EI Magnetic	Standard	S	■	■	■
TX10M0CM-4	Si/EI Non-Magnetic	Standard	S	■	■	■
TX10M0CM-5	Si/EI Magnetic	Standard	S	■	■	■

S - Standard Undamped Transducer

## Accessories

### Cables & Adaptors

TL-24030-3	T/Cable: 4' Single Lemo 00 to Microdot
TL-24030-10	T/Cable: 10' Single Lemo to Microdot
TL-24030-11	T/Cable: 20' Single Lemo to Microdot Single
TL-24030-12	T/Cable: 20' Lemo to Lemo 00
TL-24031	RS232 Cable (6'); DB-9 to Lemo
TL-24032	USB to Serial Adapter

### Couplant

TC-24034-1	Couplant: Standard; 4oz Bottle (Material Safety Data Sheet)
TC-24034-2	Couplant: Standard; 12oz Bottle (Material Safety Data Sheet)
TC-24034-3	Couplant: Standard; 1 Gallon (Material Safety Data Sheet)
TC-24034-9	Couplant: Hi-Temp 371°C; 2oz Tube (Material Safety Data Sheet)

### Other Accessories

TZ-24036	Temperature Sensor with 6' Cable
T99931809	Rubber Protective Case
T92031810	Plastic Protective Case

