

BOLT FASTENING – FORCE AND TORQUE

INDUSTRIES: AEROSPACE / AUTOMOTIVE AND VEHICLE / ENERGY /
INDUSTRIAL AUTOMATION / TEST AND MEASUREMENT

SUMMARY

Customer Need / Challenge

An Aerospace Company was working on a test plan that involved taking torque & compression measurements on fasteners with varying joint materials. The system required both high and low sampling rates, in addition to the capability of precisely measuring force and torque simultaneously. They required reliable accuracy and long-term stability. The test plan intended to provide verification of required force and torque specifications for fasteners, to ensure safety without compromising installation.

Interface Solution

Using a Model LW or LWCF Load Washer in conjunction with a Model T12 Square Drive Rotary Torque Transducer, the customer was able to align force and torque measurements to desired levels. This was accomplished by combining the sensors with the high sample rate of the data logging and graphing capabilities of the SI-USB, capturing real-time force levels for examination.

Results

The fasteners were tightened to the specified force and torque requirements and were safely installed without impairment to themselves or the joint material. The customer was able to measure the rapid event effectively and accurately.

MATERIALS

Interface Products

- Model LW or LWCF Load Washer
- Rotary Torque Models T12, T15, or T25
- SI-USB Universal Serial Bus Dual Channel PC Interface Module

Alternative Setup

- T12, T15, or T25 with Integral USB Output Option (Data Logging & Graphing Capabilities Identical to SI-USB)
- Reaction Torque Sensors: TS14, TS15, TS16, TS17

Additional Features Available

- Speed / Angle Output Option for Rotary Torque Transducers

HOW IT WORKS

1. Interface's Model LW or LWCF Load Washer is installed between the bolt head and nut. The load washer will measure the load as torque is applied to the nut.
2. A Model T12 Square Drive Rotary Torque Transducer is installed in-line with the electric nut runner to measure applied torque within assembly.
3. Real time observation of the applied force and torque is provided by mating LW or LWCF Load Washer and Rotary Torque Transducer in parallel with SI-USB 2-Channel PC Interface Module.
4. Accompanying software of Instrumentation enables customer logging and graphing of data. Excel compatible file then allows for further manipulation and analysis of this data.
5. Ultimately, the LW or LWCF Load Washer, Rotary Torque Transducer, and Data Logging Instrumentation configuration offers End-user capability to accurately monitor applied load and rotational torque of tightened fasteners.

