

Measuring Thrust

Using the TorqueTrak 10K



The **TorqueTrak 10K (TT10K)** is sold as a torque system, but it's really a general single-channel strain-gauge telemetry transmitter. It powers and amplifies the gauge bridge, has user-adjustable gain, and doesn't care what the bridge is measuring. If you bond an axial bridge to the shaft instead of a torque ($\pm 45^\circ$) bridge, it will transmit thrust strain.

How to set up the TT10K for thrust:

- **Bridge layout:** Use a full bridge with two gauges aligned axially (0°) and two transverse (90° , the Poisson gauges). Put them on diametrically opposite sides the shaft so bending cancels and temperature is compensated.
- **Alignment:** Keep the $0^\circ/90^\circ$ alignment accurate. Any skew picks up torsional shear as crosstalk.
- **Calibration:** Calculate the expected output from the shaft area, modulus, Poisson's ratio and gauge factor, then use the shunt-cal feature to set the scale, the same way you would for torque.

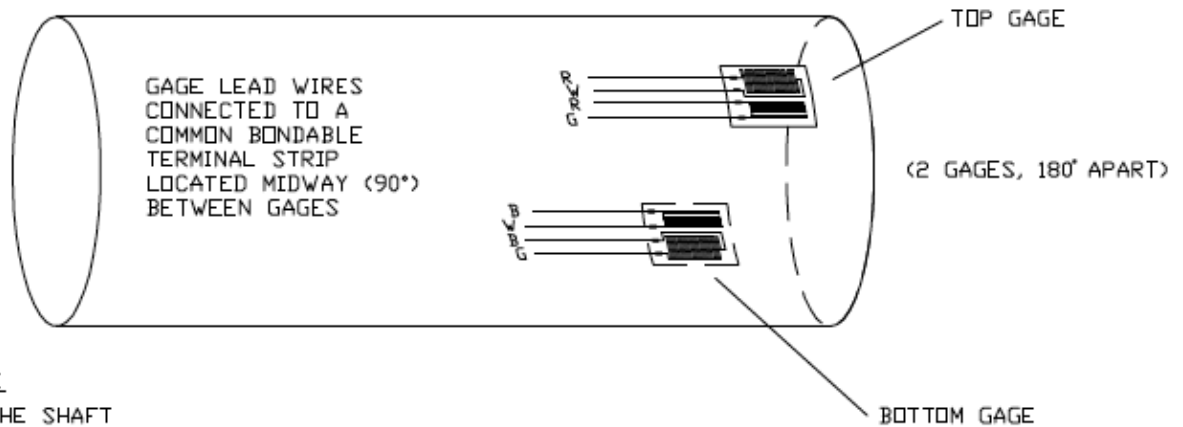


Two TorqueTrak 10K systems, a Field Test 2, and two axial strain gages are needed. Reference the guide on the back for Axial Strain Thrust Measurement.

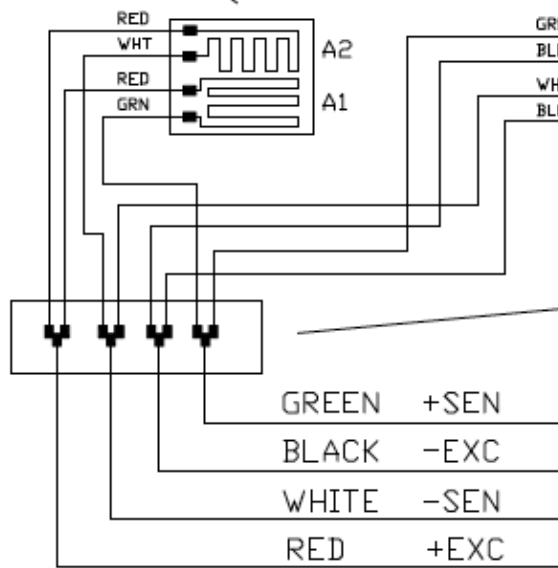


For AXIAL STRAIN (THRUST) Measurement

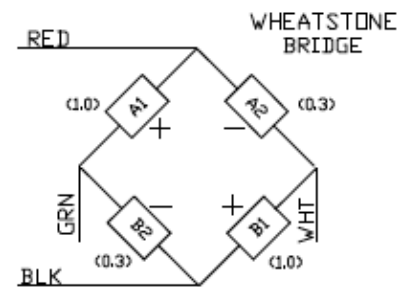
(Full bridge, temperature compensated, bending compensated output totaling 2.6 active gages)



TOP GAGE
(AS VIEWED ON THE SHAFT
WITH THE GAGE FACING YOU)



BOTTOM GAGE
(AS VIEWED ON THE SHAFT
WITH THE GAGE FACING YOU)



NOMINAL RESISTANCE VALUES

RED TO BLACK: 350 ohms
WHITE TO GREEN: 350 ohms
ALL OTHER TESTS: 262.5 ohms

STRAIN GAGE:
VISHAY MEASUREMENTS GROUP
RALEIGH, NC
PHONE: 919-365-3800
PART # CEA-06-250UT-350
(2 REQUIRED)

REVISION: 2