

BRIDGE COMPLETION NETWORK

The Bridge Completion Network is used to complete quarter and half bridge strain gauge circuits.

FEATURES

- Three 120 ohm resistors
 - Tolerance: 0.1%
 - Temperature Coefficient: +/- 25ppm
 - Power Rating: 0.1W
- Screw Terminals for easy connection.



STRAIN GAUGE



A strain gauge can be used to measure the strain of an object. The most common type of strain gauge consists of a flexible backing which supports a metallic foil pattern etched onto the backing. As the object is deformed, the foil pattern is deformed, causing its electrical resistance to change. The gauge factor of a strain gauge relates strain to change in electrical resistance. The gauge factor G_F is defined by the formula

$$G_F = \frac{\Delta R / R_G}{\epsilon}$$

where R_G is the resistance of the undeformed gauge, ΔR is the change in resistance caused by strain, and ϵ is strain. ΔR is typically in the region of 0.1%. To measure such small resistance changes, a Wheatstone bridge is employed. 3 configurations are used - quarter bridge, half bridge or full bridge. Resistors are used to form the bridge in the quarter bridge and half bridge.

Quarter Bridge Connection

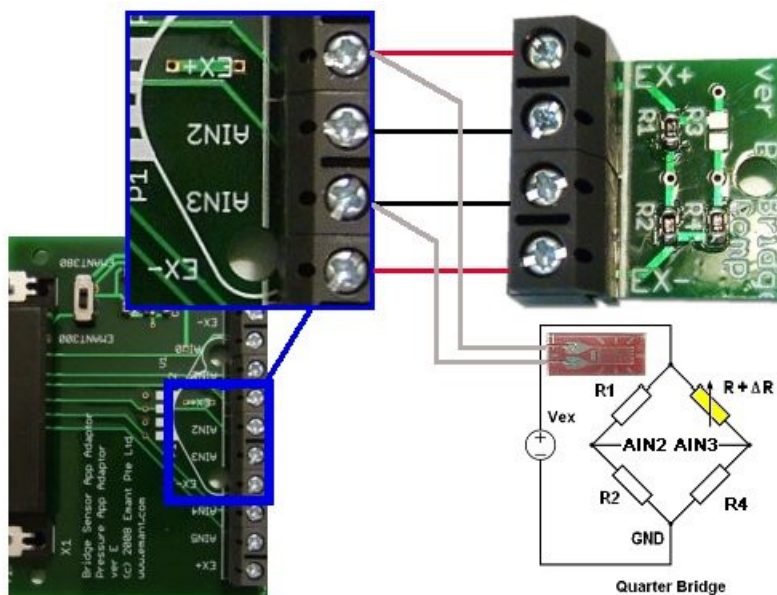


Fig 1: Connecting the strain gauge to the network and Bridge Sensor Adaptor

Strain ϵ is given by

$$\epsilon = \frac{-4V_r}{[GF(1+2V_r)]}$$

where

$$V_r = \frac{\Delta V_o}{V_{EXC}}$$

and ΔV_o is the change in voltage output of the wheatstone bridge from strained to unstrained (seen at the differential input AIN3, AIN2). V_{EXC} is the excitation voltage.

Half Bridge Connection

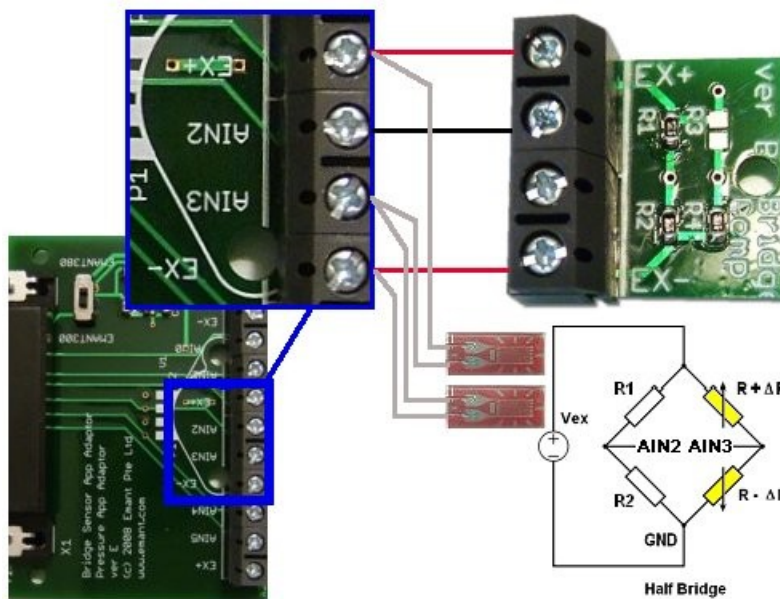


Fig 2: Connecting the strain gauges to the network and Bridge Sensor Adaptor

Strain ϵ is given by

$$\epsilon = \frac{-2V_r}{GF}$$

Schematic

