



Q.Tip: Measuring Strain Gauges – Gantner Instruments DAQ System Highlight – A106

A106– Universal Bridge Measurement Module

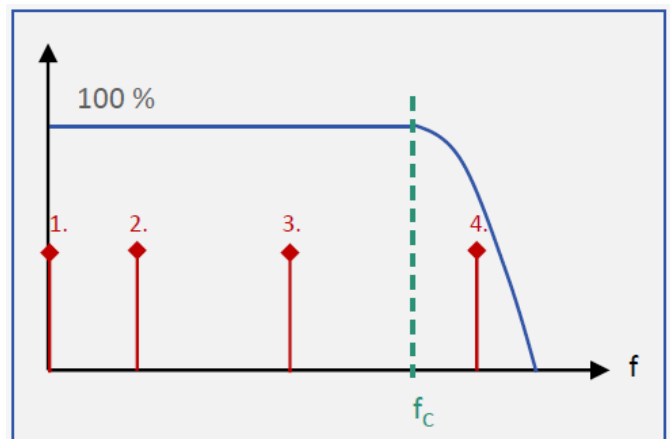
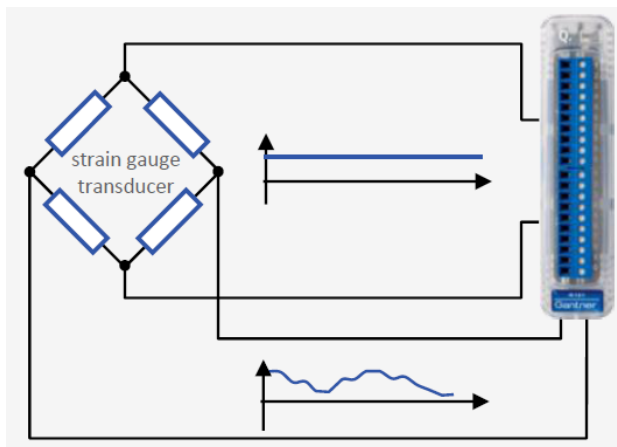
Highlights

- 2 x input channels for half or full bridge. Quarter-bridge with completion terminal block.
- Galvanic isolation: channel to channel to power supply or interface, 500 VDC.
- Strain gauge bridges (DC, CF – 600 Hz & 4800 Hz). Inductive sensors (4800 Hz).
- Sense leads (6-wire)
- Bridge Excitation: 2.5 V and 5 V
- DC and CF selectable excitation, CF: 600 Hz or 4800 Hz
- Input ranges: ± 1.25 mV/V up to 1000 mV/V in 14 steps
- Shunt control signal
- ADC 24 bit, 10 kHz
- Digital filter, averaging, min/max, alarm
- 2 x analog outputs
- 4 x digital I/Os

DC Excitation

Pros:

- High frequency range (2 kHz)
- No influence on cable capacities (long cables)
- Useable with semiconductor strain gauges (high resistance)



Cons:

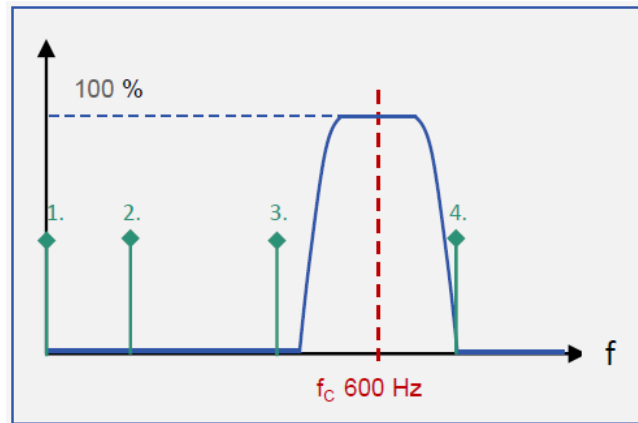
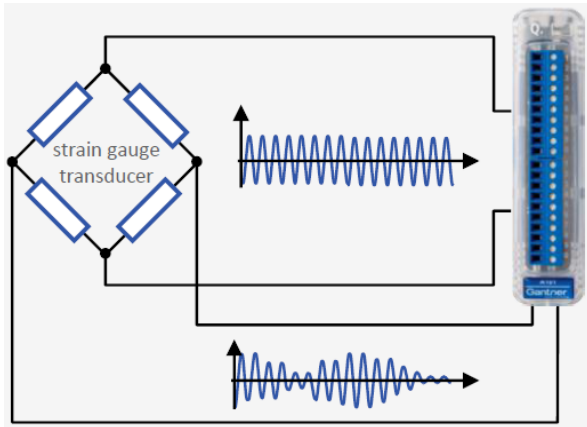
- High sensitivity against:
 1. Drift
 2. Mains influence
 3. Noise
 4. EMC
- Not usable with LVDTs



600 Hz Carrier

Pros:

- Very low sensitivity against:
 1. Drift
 2. Mains influences
 3. Noise
 4. EMC
- No influence on cable capacities (long cable)
- Usable with semi-conductor strain gauges (high resistance)



Cons:

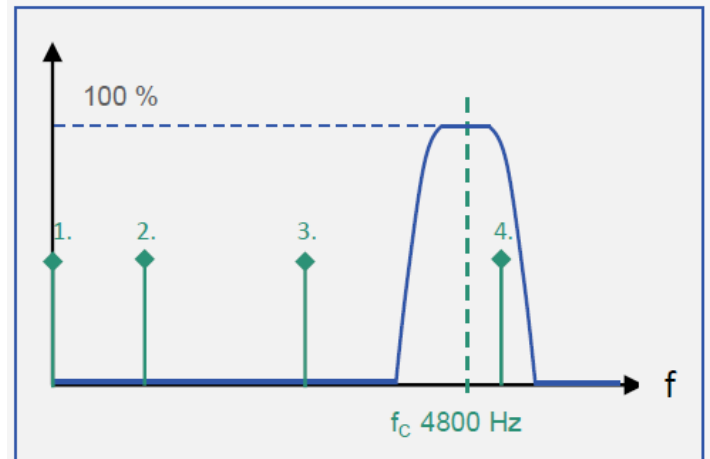
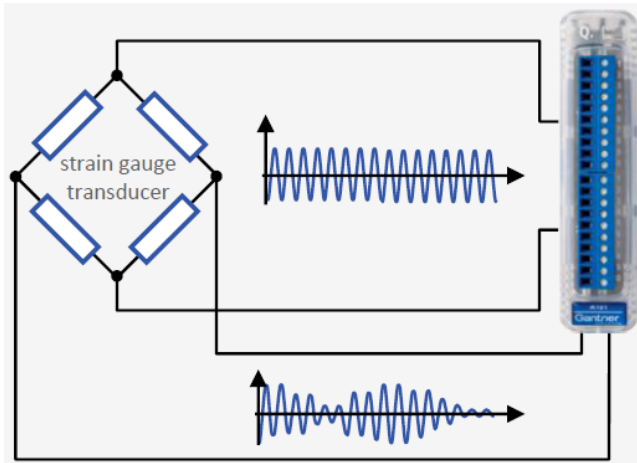
- Low frequency range (100 Hz)
- Not usable with LVDTs



4800 Hz Carrier

Pros:

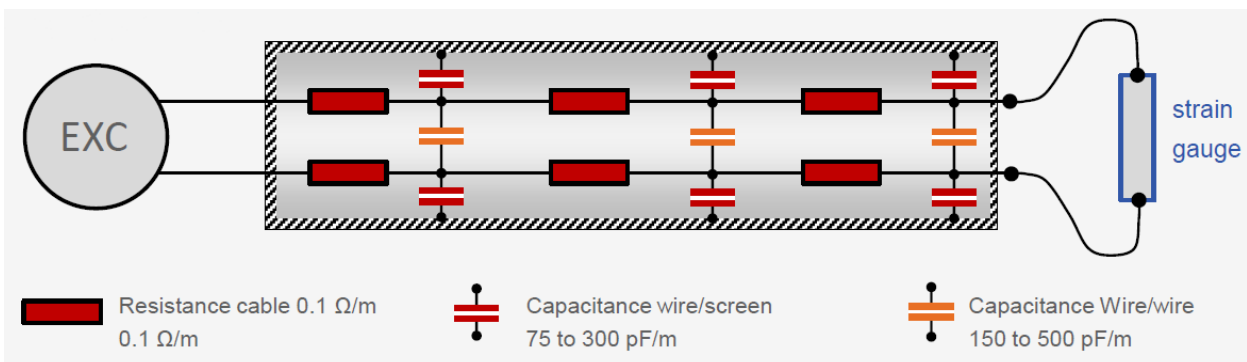
- Low sensitivity against:
 1. Drift
 2. Mains influences
 3. Noise
 4. EMC
- Good frequency range (1000 Hz)
- Usable with LVDTs



Cons:

- Influence on cable capacities (long cable)
- Not usable with semi-conductor strain gauges (high resistance)

Cable Influence



Impedance: $Z = 1 / 2 \pi f$ >>>> capacitive effect increase with frequency



Summary

Principle	Advantage	Disadvantage
DC	Dynamic Cable capacity influence Piezo-resistive sensors	EMC/noise sensitive Drift sensitivity LVDT, RVDT, inductive sensors
CF 600 Hz	EMC/noise sensitive Drift sensitivity Cable capacity influence	Dynamic Piezo-resistive sensors LVDT, RVDT, inductive sensors
CF 4800 Hz	Dynamic LVDT, RVDT, inductive sensors EMC/noise sensitive Drift sensitivity	Cable capacity influence Piezo-resistive sensors