

# CTC AppNotes

A series of technical documents written by members of the CTC community

## Field Testing of Sensor/Cable Assemblies Using Bias Voltage

### Executive Summary

#### Introduction -

When installing a permanent sensor cable combination, particularly in areas that will be inaccessible after the installation is complete, it is important to verify the assemblies proper operation.

Many accelerometer/cable faults can be diagnosed by measuring the bias voltage of the sensor amplifier. If the bias voltage is within correct limits ( discussed below ), the sensor and cable will be considered operating properly.

#### What is Bias Voltage -

The majority of most common accelerometers in today's programs have a biased output circuit. Biased output circuits utilize a two-wire sensor system used to measure the vibration dynamic AC signals.

A portable analyzer/external power supply provides a dc voltage to the accelerometer. The power supply voltage is typically 18 to 30 Volts dc. The requirements of the sensor amplifier circuit result in the voltage being drawn down to a preset level. This is typically in the range of 10 -14 Vdc.

#### Testing:

#### Test Tools -

CTC offers the TM1018 as a convenient tool for testing of a cable/sensor assembly. It provides a convenient BNC jack for cable connections and LED readouts indicating three testing mode results,

- 1- Open
- 2 - Normal
- 3 - Short



#### Alternative Testing -

**1** - Use of a portable power supply such as CTC part PS01 to supply power to the sensor/cable combination with a voltage meter tied in series measuring the dc bias voltage will give the similar results as the TM10018.

**2** - Use of a portable data collector to supply power to the sensor/cable combination with a voltage meter tied in series measuring the dc bias voltage will give the similar results as the TM1018.

#### Testing results -

A result of 10 to 14 Vdc should be considered an accelerometer/cable system operating properly. Corrections or actions are unnecessary.

A result of a voltage significantly higher than 14 Vdc, such as 23 Vdc, should be considered an accelerometer/cable system indicating a bad connection or cable malfunction.

A result of 0 Vdc will indicate either a shorted cable or sensor assembly.

#### Conclusions -

Bias voltage on permanently installed sensor/cable combinations should be checked periodically to insure proper operation

A change in Bias voltage will indicate potential problems with either the mounted sensor or the cable and it's connections.

If you have any questions or for further information please contact CTC directly via Email at [dgripe@ctconline.com](mailto:dgripe@ctconline.com) or [jsmith@ctconline.com](mailto:jsmith@ctconline.com) or feel free to call 1-800-999-5290 in the US and Canada or +1-585-924-5900 internationally.

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