

How to Diagnose TDAS PRO Sensor Calibration Failures

Seven Checks Run on Every Channel Prior to Arming

CALIBRATION DATA									
REDUNDANT A/D CHECK [%] 0.08 POWER RAILS: + 5v - 5v + 8v - 8v									
	Description	Data Chan	Noise Floor (dB)	Excitation Voltage (%)	Sensor Offset (mV)	Gain Check (%)	Auto Zero (%)	SN Ratio (dB)	Shunt Tolerance (%)
1	Demonstration Bridge	1	77.9	-0.0	-1.8	-0.1	-0.0	75.8	0.7
2		0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
3		0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
4		0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

1. Noise Floor:

Measures noise floor at a Gain of 1.

Identifies fundamental cable shielding or ground problems.

<60db may indicate a sensor wiring problem or ungrounded test device.

2. Excitation Voltage %:

Checks Excitation Voltage and Signal wires are centered between +/-excitation.

-90% to -100%: Excitation overloaded. Probable short in cable or sensor.

-200%: Signal wire(s) are not centered. Probable open or short.

3. Sensor Offset mV:

Checks sensor signal voltage.

Large numbers indicate sensor or cable problems.

Accelerometers: <50mV is normal.

Load Cells: <10mV is normal.

Potentiometers: Large offset can be normal.

4. Gain Check %:

Closed loop check that DAS actual amplifier gain is close to expected.

May indicate a test setup or DAS problem.

Can be caused by intermittent communication error. Retry to see if repeatable.

5. Auto Zero %:

Tests offset zeroing compared to center of A/D range.

<1% Normal.

5% - 20% Sensor has high offset and cannot be completely zeroed.

50% Broken sensor or cable.

6. SN Ratio dB: Signal to Noise Ratio

Measures signal to noise ratio at programmed gain. Higher numbers are better.

<40db Noise problem that requires attention - check cables, shielding and grounding.

>85db Unrealistic. Possible railed A/D convertor. Sensor or wiring problems.

7. Shunt Tolerance %

Shunt Emulation applies constant current to bridge and compares measured shift to expected shift.

Sensor not plugged-in.

Broken sensor or wires.

Bridge resistance does not match SIF (expected) value.

How to Diagnose TDAS PRO Sensor Calibration Failures

Samples of Sensor Calibration Failures and Possible Causes

	Description	Data Chan	Noise Floor (dB)	Excitation Voltage (%)	Sensor Offset (mV)	Gain Check (%)	Auto Zero (%)	SN Ratio (dB)	Shunt Tolerance (%)
1	Demonstration Bridge	1	78.2	-0.0	-2.0	-0.1	-0.0	76.1	0.7

Normal

1	Demonstration Bridge	1	38.5	0.0	-2836.0	0.0	1.3	35.4	475.4
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Sensor Not Plugged In : +Sig Open : - Sig Open

1	Demonstration Bridge	1	78.8	-100.0	-0.2	-0.1	-0.0	75.2	-0.4
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+/-Exc Short or Open : +Exc Grounded : -Exc Grounded

1	Demonstration Bridge	1	78.0	-200.1	-4.1	-0.3	0.0	76.0	-52.6
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-Exc Open

1	Demonstration Bridge	1	80.1	-200.0	4.1	-0.2	-0.0	75.5	0.5
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+Exc Open

1	Demonstration Bridge	1	78.5	-0.0	-0.2	-0.1	-0.0	75.9	-100.0
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+/- Sig Short : -Sig grounded : +Exc and -Exc Open

1	Demonstration Bridge	1	80.0	-0.0	-2.0	-0.2	-0.0	75.1	49.4
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+Sig Grounded

1	Demonstration Bridge	1	79.1	-0.0	-4971.6	-0.1	-0.0	76.7	402.0
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+Exc to +Sig Short

1	Demonstration Bridge	1	78.0	-0.0	4952.7	-0.3	1.2	76.3	-392.9
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-Exc to +Sig Short

1	Demonstration Bridge	1	77.9	-200.0	4949.9	-0.1	1.2	76.3	-100.0
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+Exc to -Sig Short

1	Demonstration Bridge	1	78.8	-200.0	-4967.2	-0.3	0.0	75.8	294.9
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-Exc to -Sig Short

* Examples shown are at with a **TDAS PRO SIM** at 10V excitation, full bridge sensor. TDAS G5 may give different results. Other combinations are possible. Numbers can vary. Problems can be in wiring, connector or internal to the sensor. To test TDAS PRO DAS, unplug sensors and run test with Example SIFs\Empty Channel.sif