



Multi-Channel Strain Gage Amplifier

User Manual



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Multi-Channel Strain Gage Amplifier

- Turnkey solution for MSC Multi-Axis Load Cells
- Available as 3, 6, or 12 channel units
- Highly accurate bridge excitation
- Provides high level voltage signal output
- Precision, low noise differential amplifier
- Bridge excitation On/Off capability
- Shunt calibration capability
- Wide input voltage range

The Michigan Scientific Multi-Channel Strain Gage Amplifier is a turnkey solution for use with any of MSC's Multi-Axis Load Cells. Up to four of MSC's wide variety of Three Axis Load Cells can be connected to the amplifier. The Multi-Channel Strain Gage Amplifier provides highly accurate excitation voltage to the load cell, a stable differential amplifier, and integrated shunt resistors for system calibration. The result is an accurate high level voltage output signal. The shunt calibration can be easily invoked with the flip of a switch and bridge excitation can be turned on or off while the amplifier package remains powered.



Specifications

Bridge Excitation	
Type	DC Constant Voltage (Bipolar Excitation)
Magnitude	±5 V (10 V total)
Accuracy	0.10 %
Temperature Drift	0.0005 %/°C Max (0.00028%/°F)
Minimum Bridge Resistance	350 Ω
Integrated Calibration	
Positive & Negative Shunt Calibration	
Shunt Resistance	100 kΩ
Shunt Accuracy	0.01 %
Gain	
Nominal Gain	201 V/V
Accuracy @ 25 °C, Gain =201	±0.1 % typ
Temperature Drift	0.0025 %/°C (0.0014 %/°F)
Output	
Range	Max ±10 V
Voltage Offset	
Referred to input of amplifier	
Initial @25°C	±25 μV
Temperature Stability	±0.2 μV/°C
Dynamic Response	
Frequency Response -3 dB @Gain=201	7.5 kHz
Power Requirements	
Voltage	9 Vdc to 36 Vdc
Current	1 A
Environment	
Operation Temperature	0 °C to +70 °C (32 °F to +158 °F)
Mechanical	
Size (L x W x H)	16.00 cm x 10.80 x 5.86 cm (6.30 in x 4.25 in x 2.30 in)

Operation

The Multi-Channel Strain Gage Amplifier must be powered with 9 Vdc to 36 Vdc.

1. The power switch powers on the device.
2. The bridge kill switch turns excitation to the bridges on or off while the amplifier package remains powered
3. The shunt calibration switch must be held in the positive or negative position to output shunt voltage.



Installation Instructions

Connect up to four load cells through the load cell array located on the back panel.



Connect power input cable to the back of the Multi-Channel Strain Gage Amplifier.



Connect the high density DB breakout connector to the Signal output on the front panel.

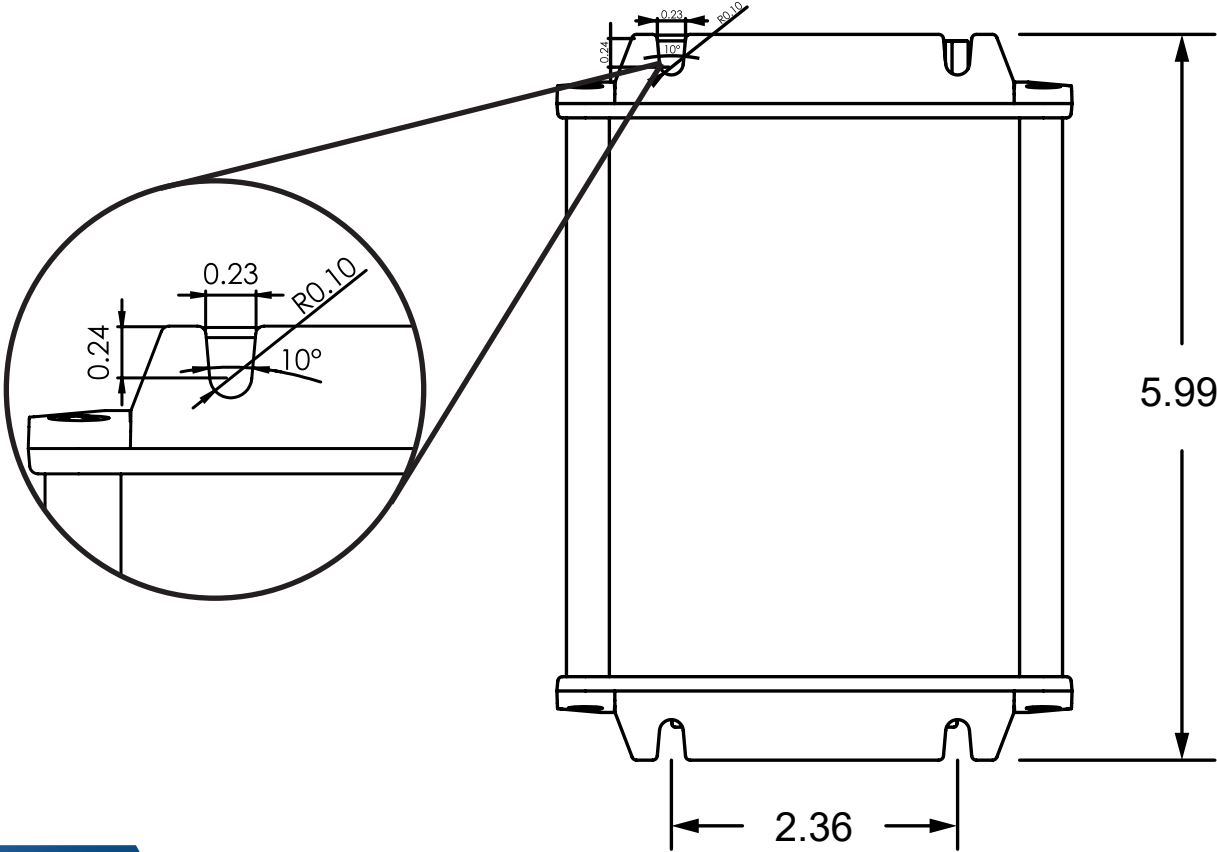
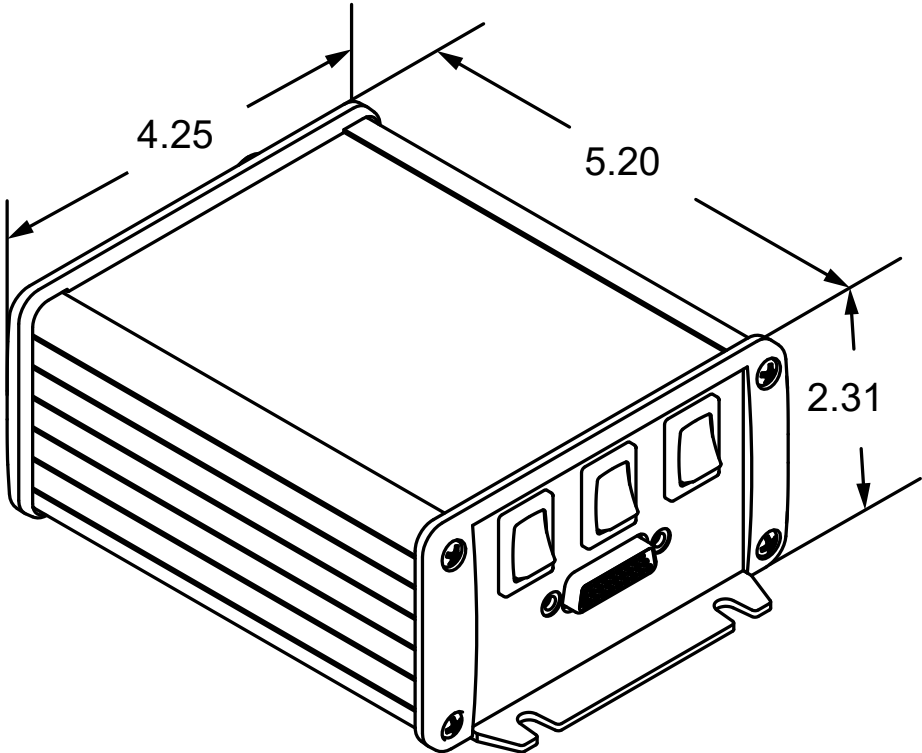
The output cable provides voltage signals from the load cell(s). Signals from each load cell are bundled in a wire group (labeled 1-4). The cable pin-out is located in the Appendix.



Turn on power to amplifier box. The load cells should now output a voltage proportional to experienced forces. The sensitivities for each load cell can be found on their associated calibration sheet. Each signal has a ± 10 V measurement range. Transducer unbalance (no-load output) should be removed in the data-acquisition system through either nulling the channels before recording or during post-processing.

Dimensions

Overall dimensions in inches.



Appendix

Signal Output Wire Diagram

Bundle wire groups [1-4], 6 wires per bundle

26-PIN DSUB OUTPUT

Pinout	Wire Color	Function	Bundle
1	Black	1X +	Load Cell Input 1
2	Brown	1Y +	
10	White	1X -	
11	Pink	1Y -	
12	Mint Green	1Z -	
19	Purple/White	1Z +	
3	Red	2X +	Load Cell Input 2
4	Orange	2X -	
13	Black/White	2Y -	
20	Red/Black	2Y +	
21	Orange/Black	2Z +	
22	Yellow/Black	2Z -	
5	Yellow	3X +	Load Cell Input 3
6	Green	3Y +	
14	Brown/White	3X -	
15	Red/White	3Y -	
16	Orange/White	3Z -	
23	Green/Black	3Z +	
7	Blue	4X +	Load Cell Input 4
8	Purple	4Y +	
9	Gray	4Z +	
17	Green/White	4X -	
18	Blue/White	4Y -	
24	Gray/Black	4Z -	
25	Pink/Black	nc	
26	Pink/Red	nc	

