Load Cell Amplifier / Strain Gauge Amplifier with Linearity Correction
ASDL1B

The ASDL1B is a circular board for 3-wire systems providing a 4mA - 20mA current output with adjustable linearity correction. The unit has individual multi-turn potentiometers for the precise setting of Zero, Span and **Linearity adjustment** without the need of a computer. This unit is also available with **mid. zero output** (12mA for example) for compression/tension transducers. The inputs provide EMI-/RF-suppression. Transducer wires can be easily connected to board via soldering or SIL sockets.

Features

- Wide range power supply 18-30V
- 5V stabilised bridge excitation
- Bridge resistance 350 Ohm (or greater)
- Bridge sensitivity 0.6mV/V – 3mV/V
- Size 42mm diameter, 15mm height
- Fast calibration procedure
- Reverse-polarity protection
- Easy linearity correction procedure

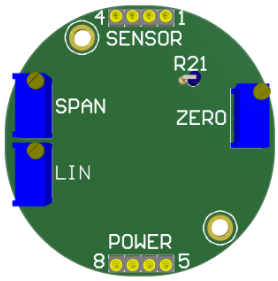
Applications

- Industrial Weighing
- Load Testing & Monitoring
- Overload Protection Systems

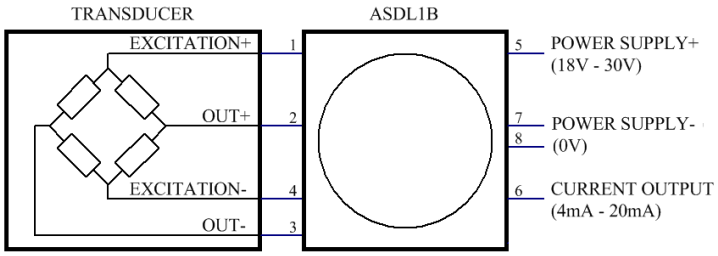
Ordering

Part number:	ASDL1B*
*Please specify required input range, between 0.6mV/V – 3mV/V Default: 2mV/V (R2=910 Ohm, R21 not assembled)	
Customer specific electrical / mechanical changes are possible – please contact us with your individual requirements.	

Board Connections



Schematic Diagram



Specifications

Parameter	Min	Typical	Max	Unit
Supply Voltage	18	24	30	V
Current Output – Zero (adjustable control)	1.6	4		mA
Current Output – Span (adjustable control)		20	24	mA
Bridge Sensitivity	0.6		3	mV/V
Bridge Resistance	350			Ohms
Bridge Excitation Voltage		5		V
Linearity Correction Range		+/-1.8		mA @12mA
Current Output Temp. Coefficient – Zero		0.3		uV/°C

Parameter	Min	Typical	Max	Unit
Current Output Temp. Coefficient – Span		0.01		%/°C
Operating Temperature	-20		50	°C

Installation, Calibration and Sensitivity:

1. Installation

The unit has multi-turn potentiometers for the precise setting of Zero, Span and Linearity.
The amplifier features a linearity correcting circuit which adds a parabola to the normal straight line characteristic. The amount of correction which may be positive or negative and reaches a maximum at 50 % full scale is controlled by a single potentiometer adjustment. The circuit is designed to minimise the interaction of settings. The linearity correction has no effect at zero or at full scale.

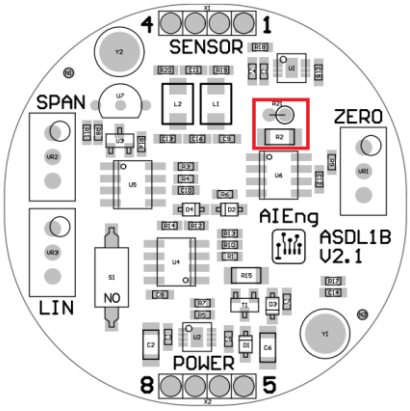
2. Calibration Procedure

The linearity switch should be placed in the „off“ position.
At zero load use the ‘ZERO’ potentiometer to set 4.00mA.
At full load use the ‘SPAN’ potentiometer to set 20.00mA.
Check and repeat as necessary.

If the linearity function is required the switch should now be placed in the „on“ position.
At about 30 % full load use the ‘LIN’ potentiometer to correct the output as desired.
Check and repeat as necessary.

3. Sensitivity (mV/V)

The amplifier’s gain is matched to the load-cell full-scale sensitivity (mV/V) by the value of resistor R2 (SMD, default) or R21 (THT). Only one of these resistors should be assembled.



For example:
for 1mV/V load cell, use R2=470 x 1 = 470 Ohm
for 2mV/V load cell, use R2=470 x 2 = 940 Ohm = 910 Ohm (nearest value)

If the calculated resistor value is not readily available use the nearest value.

Resistor should be 1% 100ppm/C 1/8 watt grade or better. Use either THT (1/8 watt) or SMD 1206 [3216 Metric].
Example: THT MF12 series from Farnell Electronics: 100R, Part MF 12 100R, Order code: 9342397.

Typical Results

Settings: 1mV/V ; Calibrated at zero=4mA, span=20mA; 350R bridge, Vin=24V

mV/V	LIN off	LIN on I@0,5=12mA	LIN on I@0,5=11,5mA	LIN on I@0,5=11mA	LIN on I@0,5=10,5mA	LIN on I@0,5=12,5mA	LIN on I@0,5=13mA	LIN on I@0,5=13.5mA
0,0	4,01	4,01	4,01	4,01	4,01	4,01	4,01	4,01
0,1	5,61	5,61	5,42	5,25	5,06	5,78	5,96	6,14
0,2	7,21	7,20	6,88	6,56	6,23	7,52	7,84	8,17
0,3	8,80	8,80	8,38	7,95	7,53	9,22	9,65	10,08
0,4	10,40	10,40	9,92	9,42	8,95	10,88	11,37	11,85
0,5	12,01	12,00	11,50	11,00	10,49	12,51	13,01	13,51
0,6	13,60	13,59	13,10	12,63	12,16	14,09	14,56	15,05
0,7	15,20	15,20	14,78	14,36	13,94	15,62	16,04	16,47
0,8	16,80	16,80	16,48	16,16	15,86	17,12	17,44	17,77
0,9	18,40	18,41	18,23	18,05	17,87	18,59	18,75	18,94
1,0	20,01	20,02	20,01	20,02	20,02	20,00	20,00	20,01

Current Output (mA) versus Input (mV/V)