Universal Load Cell Amplifier / Strain Gauge Amplifier
AS7539A

The AS7539A is a universal 3-wire amplifier providing **seven** modes of operation (current/voltage and unipolar/bipolar outputs). It has individual multi-turn potentiometers for the precise setting of Zero and Span and 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 clamped onto the board. Two additional extension boards (ASM1) are also available providing multiple transducer processing (allowing up to 4- or 8-amplifiers), along with rugged aluminium enclosures offering IP66 protection.

Features

- Wide range power supply 13-32V
- 10V stabilised bridge excitation
- Bridge resistance 87 Ohm (or greater)
- Bridge sensitivity 0.3mV/V – 3mV/V
- Size 48mm x 41mm x 19mm height
- Fast calibration procedure
- Reverse-polarity protection

Applications

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

Ordering

Part number:	AS7539A*
*Please specify required input sensitivity and output type (current/voltage and unipolar/bipolar) Default 2.0mV/V: AS7539A-2.0MV, 0-10V Output	
Customer specific electrical / mechanical changes are possible – please contact us with your individual requirements.	

Board Connections
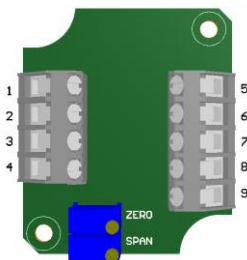
Schematic Diagram
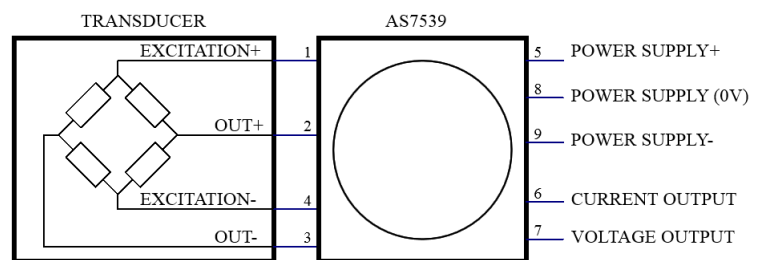
Specifications

Parameter	Min	Typical	Max	Unit
Supply Voltage Vin (unipolar voltage/current output)	13	24	32	V
Supply Voltage Vin (bipolar voltage output)	-13 to -18		+13 to +18	V
Current Output – Zero (adjustable control)	3.9	4		mA
Current Output – Span (adjustable control)		20	23	mA
Voltage Output – Zero (adjustable control)		0.004 / 2.5		V
Voltage Output – Span (adjustable control)		5.0/7.5 /10.0	Vin	V
Bridge Sensitivity	0.3		3	mV/V
Bridge Resistance	87			Ohms
Bridge Excitation Voltage		10.0		V

Parameter	Min	Typical	Max	Unit
Current Output Temp. Coefficient – Zero		0.3	1	uV/°C
Current Output Temp. Coefficient – Span		0.01		%/°C
Operating Temperature	-20		50	°C

Seven configurable output modes are available:
1. 4-20mA current **2**. 4-12mA-20mA current **3.** 0-5V voltage **4.** 0-10V voltage **5.** 2.5 to 7.5V voltage **6.** –5V to +5V voltage **7.** –10V to +10V voltage
2. max sensitivity 2mV/V for 4-12-20mA current output

1. Installation

Default settings are:

Unipolar supply (24V)
Output sensitivity: 2mV/V (R1=220R)
Output range: 0-10V (Link 2, Link B, R3=not assembled, R7=10k)

Normally we will set-up the unit to the requirements indicated in your order. If alternative settings are required later, follow the procedures detailed below.

Power Suppy	Board changes
Unipolar supply (13 – 32V)	Make LK4 (default) (pin 9 needs to be connected to pin 8 if the board was previously configured for bipolar supply operation)
Bipolar supply (+/-13 to +/-18V)	Open LK4 by cutting PC track

Output Range	Board changes
2.5-7.5V	Link 1, Link A, R3=not assembled, R7=10k
0-5V, 0-10V	Link 2, Link B, R3=not assembled, R7=10k
0+/-5V, 0+/-10V	Link 2, Link B, R3=not assembled, R7=not assembled, Cut LK4
4-20mA	Link 3, Link A, R3=30k, R4=62k, R7=not assembled
4-12-20mA **(Zero Load = 12 mA)**	Link 3, Link A, R3=10k, R4=22k, R7=not assembled

www.aieng.co.uk
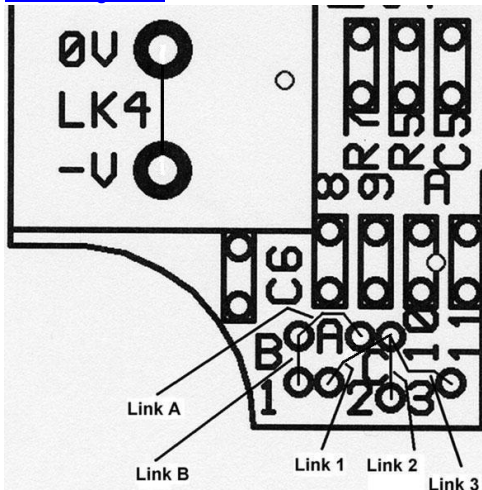
2. Calibration

At zero load use ZERO potentiometer to set to zero output (example 4.00mA for current, 0.01V for voltage)
At full load use SPAN potentiometer to set to maximum output (example 20.00mA for current, 10.00V for voltage)

Repeat above procedure several times until both settings are reached.

3. Sensitivity

The amplifier is matched to the load-cell full scale sensitivity (mV/V) by the value of resistor R1

For 4-20mA, 0-5V, 0+/-5V and 2.5-7.5V ranges:
  R1 = 220 x mV/V   Ohms

Example: load-cell is 2mV/V. Therefore when configured for 0-5V voltage output, R1 = 220 x 2 = 440 Ohms. Use 430R nearest value.

For 4-12-20mA range:
  R1 = 1320 x mV/V Ohms

Example: load-cell is 2mV/V. Therefore, R1 = 1320 x 2 = 2640 Ohms. Use 2.7K nearest value.

For 0-10V and 0+/-10V ranges:
  R1 = 110 x mV/V Ohms

Example: load-cell is 2mV/V. Therefore when configured for 0-10V voltage output, R1 = 110 x 2 = 220 Ohms.

If the calculated resistor value is not readily available use the nearest value.
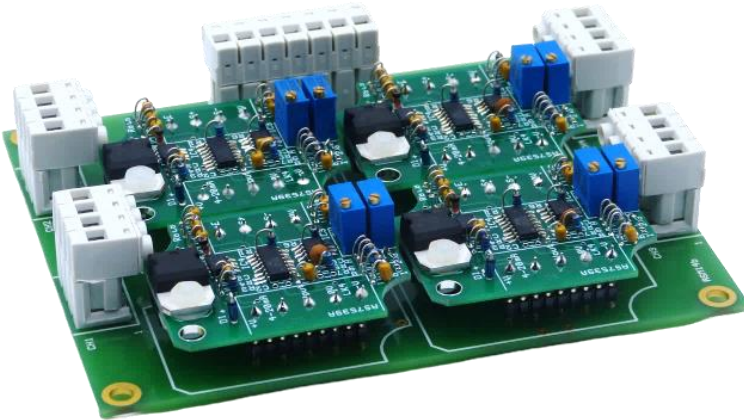
Resistor should be 1% 100ppm/C 1/8 watt grade or better. Use either THT (1/8 watt) or SMD (0805) resistor.
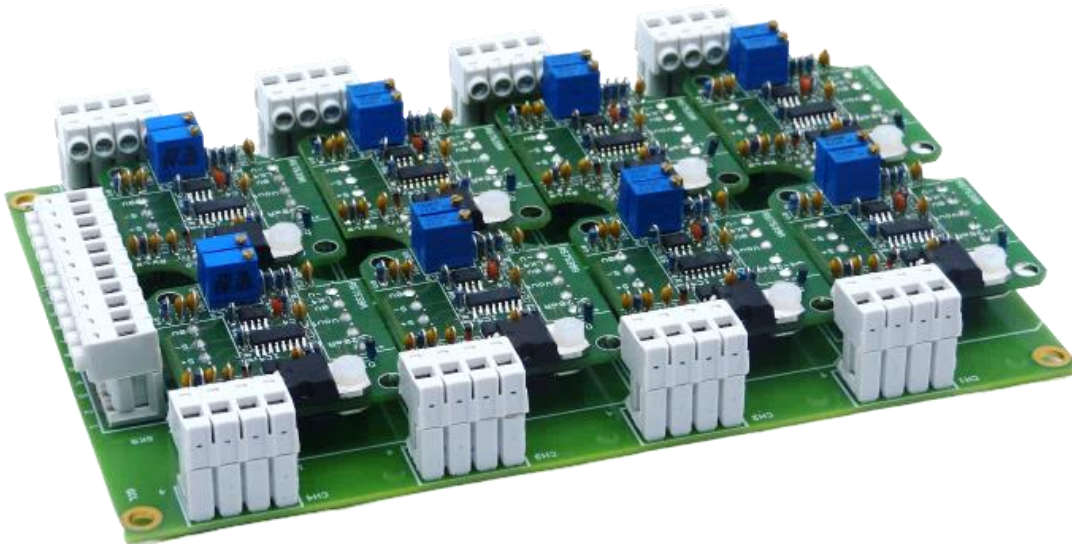Example: THT MF12 series from Farnell Electronics: 100R, Part MF 12 100R, Order code: 9342397.

Optional Extras (Motherboards and Enclosures)

Part number:	AS7539A-ASM1-4	Motherboard for up to 4 AS7539A amplifiers

Part number:	AS7539A-ASM1-8	Motherboard for up to 8 AS7539A amplifiers

Part number:	AS7539A+ENCL1	IP66 Enclosure for 1 AS7539A incl. 2x PG7 cable glands

Part number:	AS7539A+ENCL2	IP66 Enclosure for ASM1-4 incl. cable glands

Part number:	AS7539A+ENCL3	IP66 Enclosure for ASM1-8 incl. cable glands