Universal Load Cell Amplifier / Strain Gauge Amplifier
ASUNIAMP

The ASUNIAMP is a universal and highly flexible board providing two outputs. Output 1: 4-20mA / 4-12mA-20mA, Output 2: 0-5V / 0-10V / 2.5-7.5V / 0+-5V / 0+-10V, designed to fit inside a standard DIN-rail carrier enclosure. The unit has individual 8-way switches for coarse adjustments and dual multi-turn potentiometers for the very precise setting of Zero and Span. Additionally it offers a mid. zero output option (for example 12mA) suitable for compression / tension transducers. The inputs provide EMI-/RF-suppression and the board has been tested for radiated immunity. The transducer, power supply and output wires can be easily connected to the board using a single 12-way clamp connector (supplied).

Features

- Wide-range power supply 12-28V
- 10V or 5V stabilized bridge excitation
- Bridge resistance 120 Ohm (or greater)
- Bridge sensitivity 0.35mV/V – 3.5mV/V
- Size (LxBxH): ca. 72 x 108 x 24 mm
- Fast calibration procedure
- Output filter (off, TC: 0.002 – 1 sec.)
- Switchable Zero/Span ranges
- Transducer remote-sensing

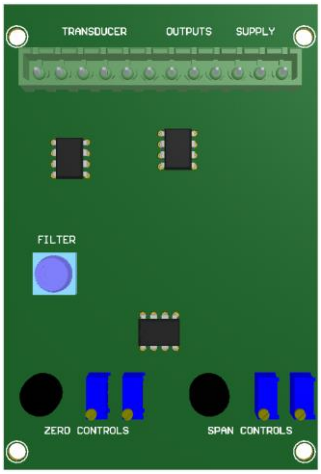
Applications

- Industrial Weighing Applications
- Onboard Weighing
- Load Testing & Monitoring

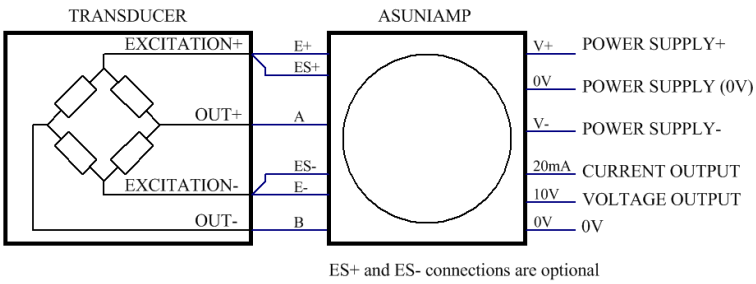
Ordering

Part number:	ASUNIAMP
Default settings: single-supply, 4-20mA or 0-10V output, 10V excitation, no remote-sensing, with DIN enclosure ENCL1	
Customer specific electrical / mechanical changes are possible – please contact us with your individual requirements.	

Board Connections



Schematic Diagram



ES+ and ES- connections are optional

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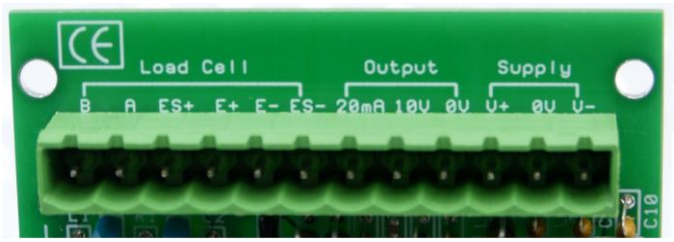
Specifications

Parameter	Min	Typical	Max	Unit
Supply Voltage (4-20mA, 0-5/10V output)	12	24	28	V
[1]Supply Voltage (0+-5V / 0+-10V output)	-12 to -16		+12 to +16	V
Supply Current		120		mA
Current Output – Zero (adjustable control)	3.8	4.00	8.0	mA
[2]Current Output – Span (adjustable control)	15	20.00	24	mA
Output Voltage – Zero (adjustable control)		0.003		V
[3]Output Voltage – Span (adjustable control)		10.00		V
Bridge Sensitivity	0.35		3.5	mV/V
Bridge Resistance	120			Ohms
Bridge Excitation Voltage	5.0	10.0		V
Temperature Coefficient – Zero		0.3		uV/°C
Temperature Coefficient – Span		0.007		%/°C
Operating temperature	-20		50	°C
Radiated immunity (EN 6100-4-3:1996 level 2, 80MHz – 1 GHz, 3V/m)		>1		% error

[1] for bi-directional voltage output, [2] into 0 – 1 kOhms load (24V), [3] into > 4 kOhm load

Installation, Calibration and Configuration:

1. Installation - Terminal Connections:



Pin Number	Connector Name	Description
1	B	Transducer output negative
2	A	Transducer output positive
3	ES+	Excitation positive sense
4	E+	Excitation positive
5	E-	Excitation negative
6	ES-	Excitation negative sense
7	20mA	Current output
8	10V	Voltage output
9	0V	GND
10	V+	Positive supply
11	0V	GND
12	V-	Negative supply (for bi-directional systems only)

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2. Calibration:

The amplifier must be calibrated for the intended output (voltage or current).

ZERO – remove any load from the transducer

Setting the coarse ZERO switch to position 8, sets the output to zero. Switch positions 7, 6, 5 send the output increasingly positive, whereas switch positions 1, 2, 3, 4 send the output increasingly negative at about 0.5 mV/V per position. Use the multi-turn potentiometers VR2 and VR1 for medium and fine ZERO tuning.

Most systems have a very small mechanical offset (<0.1 mV/V). In such cases, the coarse ZERO switch should be set to position 8. Then, use VR2 (medium) and VR1 (fine) to adjust the output to zero.

However, some systems may exhibit a larger mechanical offset (>0.2 mV/V). To suppress these preloads, follow the procedure below:

1. Start with the ZERO switch in position 8.
2. Rotate the switch clockwise until the output voltage (or current) exceeds 0.003 V (4.00 mA), such as reaching 1.009 V.
3. Next, rotate VR2 counterclockwise to reduce the output to 0.003 V (4.00 mA).
4. If rotating VR2 counterclockwise has no effect on the output, rotate it 14 times clockwise to bring it within the middle tuning range. Repeat the above procedure from step 1.

SPAN – apply a load at full-scale on the transducer

Rotate the coarse SPAN switch until the output is just greater than required and then rotate the switch back one step. Now use the multi-turn potentiometers VR4 and VR3 for medium and fine SPAN tuning.

Repeat above procedure several times until both settings are reached.

For example: required output 10V

1. Start with the SPAN switch in position 8.
2. Rotate the switch clockwise until the output voltage (or current) just exceeds 10.00 V (20.00 mA), now switch back one step.
3. Next, rotate VR4 clockwise to increase the output to 10.00 V (20.00 mA). Use VR3 for fine-tuning.
4. If rotating VR4 clockwise has no effect on the output, rotate it 14 times counterclockwise to bring it within the middle tuning range. Repeat the above procedure from step 1.

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3. Configuration:

The amplifier is factory set for: single-supply, 4-20mA or 0-10V output, 10V excitation, no remote-sensing. It may be configured by cutting or connecting links on the PCB board as shown below.

LINK	Use	Location	Factory Setting
LK1	Open or 5V excitation Close for 10V excitation	Reverse side	closed
LK2	Close for 12mA current zero	Top side	open
LK3	Open for 0mA current zero	Reverse side	closed
LK4	Open for bidirectional +/-16V power supply	Reverse side	closed
LK5	Open for offset voltage output	Reverse side	closed
LK6	Close for offset voltage output	Top side	open
E+, ES+	Open for remote-sensing	Reverse side	closed
E-, ES-	Open for remote-sensing	Reverse side	closed

Special Ranges and Settiings

The board can be configured for special operation as shown below.

Description	Setting
5V excitation voltage	The default excitation is 10V. If self-heating of gauges is a problem the excitation may be reduced to 5V by opening link LK1.
4mA – 12mA – 20mA curent output Also referred to as 12mA at zero	For tension / compression load-cell applications. Close link LK2.
2.5V – 7.5V voltage output (offset voltage)	Open link LK6. Install reference diode 2.5V at D7.
Remote-sensing	When a low resistance cell is mounted at a distance from the amplifier, voltage drops in the cable may be compensated by remote-sensing. Open links between E+, ES+ and E-, ES-. Then make a six wire connection to the load-cell.
Bi-directional output (0+-5V / 0+-10V also referred to as +/-5V, +/-10V).	Open link LK4 and connect bi-polar power supply to connector pins V+, 0V, V-.

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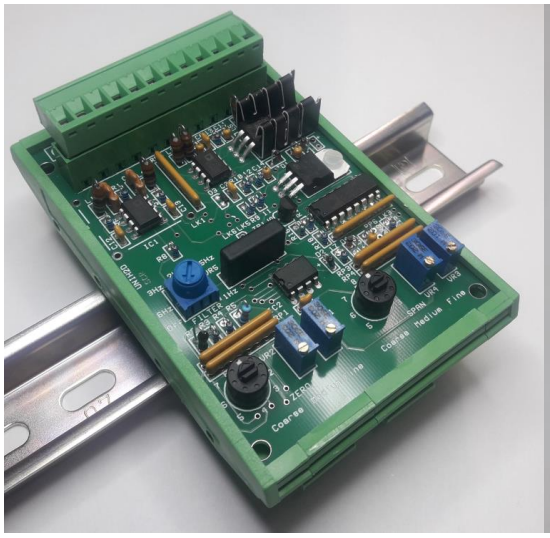
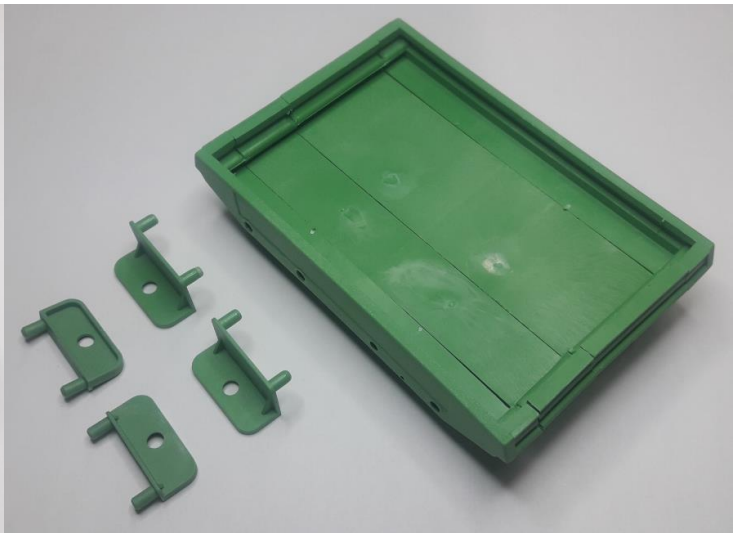
Optional Extras (supplied as standard)

Part number:	ASUNIAMP-ENCL1	ABS DIN-Rail Enclosure (opt. wall-mounting plates)





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