

OVERVIEW

The ultra miniature strain gauge amplifier AMP-UM10KB has been developed based on modern chip technology to meet the growing need for strain measurements in demanding industrial environments, where miniature size and easy set-up are essential.

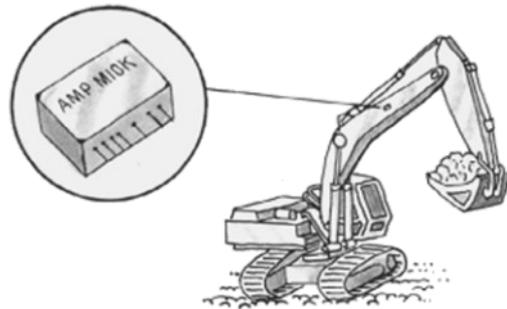
The design concept is based upon the ability to place complete strain gauge conditioning (stable 5-V bridge excitation and precision instrumentation amplifier circuitry) in close proximity to the strain gauges. An amplified (high level) output signal which has good immunity to noise can be safely transmitter via slip rings or long cables, which considerably reduces noise and increases signal integrity.

AMP-UM10KB is a fixed gain device with nominal gain of 1000. Other fixed gain values are available on request.

All the electronic components integrated on board of AMP-UM10KB, provide a high bandwidth (7 kHz at Gain = 1000), very small overall dimensions and modest power supply requirements (single 9 V battery or unregulated power supply 6-16 V DC), which makes it an ideal tool for field instrumentation engineers.

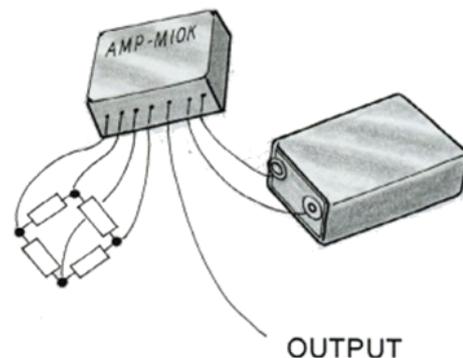
Applications of the AMP-UM10KB include:

- Automotive
- Rail traction
- Aeronautics
- Rotating machinery
- Specialised load-cells
- Civil engineering
- Biomechanics
- Research and development.



OPERATION

For normal operation, AMP-UM10KB requires single voltage supply between 6 V and 16 V DC. Most typically the unit is powered by a 9 V or 12 V battery, or a DC power supply. To handle both positive and negative output signals, the unit is equipped with on-board negative power supply rail generation electronics which eliminates the need for dual power supplies. This features considerably increases flexibility in field instrumentation applications.



Quality Management System
ISO 9001:2008
Cert. No. 17 618255

- machine dynamics, NVH, failure analysis, fatigue/accelerated life testing
- specialised instrumentation, data acquisition and analysis
- rotating machinery design and troubleshooting:
gearboxes, shafts, bearings, couplings, belts and chains

Company registered in England No. 3284935 VAT Reg No. GB 660 2407 64

JR Dynamics Ltd

Unit 4, Arcot Court,
Nelson Ind. Estate, Cramlington,
Northumberland, NE23 1BB, UK

T +44 (0) 191 58 000 58

E support@jrdltd.com

www.jrdltd.com

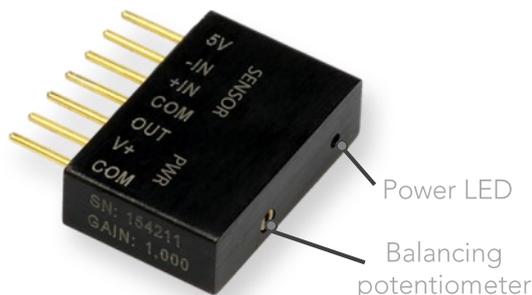
The AMP-UM10KB is also equipped with an auto calibration feature where a precision 249 k Ω shunt resistor is connected to one limb of the Wheatstone bridge for 5 seconds on start up.

Current consumption of the strain gauge amplifier is very low (less than 4 mA) and hence the required current capacity is determined by the strain gauge resistance (46 mA with 120 Ω and 18 mA with 350 Ω strain gauges).

To visually check if the unit is powered, AMP-UM10KB is equipped with a white LED positioned on the top of the amplifier. If correct power supply conditions exist, the LED illuminates. This feature can be particularly useful in cases when the strain gauge installation and AMP-UM10KB are positioned in a remote location from power supply sources and quick visual inspection can easily identify problems with the power supply.

BALANCING

AMP-UM10KB is equipped with a 25 turn on-board balancing potentiometer which allows to zero the output for zero load conditions, or to pre-set the required reference voltage. For special applications, where adjustment of the bridge out-of-balance is not required, the unit is also available with no balancing or calibration facility.



ELECTRICAL - MECHANICAL

The device is screened to protect against EMI and is totally encapsulated to provide an extremely ruggedised package with guaranteed operation up to 3000 g.

AMP-UM10KB is a SIL device based on standard 0.1" pin spacing, which also make it convenient for direct applications interfacing with standard SIL sockets.

Both input pins IN+ and IN- are internally protected against voltage transients of up to ± 40 V by using an internal current limiting device and not series resistor which could contribute to input noise. The inputs are protected even if the power supply is disconnected or turned off. The device is also protected against continuous output short circuits to ground.

SPECIFICATION

Dimensions:	20 x 13 x 6 mm (excl. pins)
Power supply:	Single 6 - 16 VDC
Bridge supply:	Constant 5 V nom.
Gain:	1,000 standard Non-standard made to order
Dynamic response:	DC - 7 kHz (-3 dB) at 1,000 gain
Temperature	-40°C to +125°C
Mass:	4 grams
Nonlinearity:	$\pm 0.02\%$ of FSR
CMR:	100 dB (min)
Gain vs. temp.	± 25 ppm/°C typ.
Current cons.	<7 mA @ 6 VDC



- machine dynamics, NVH, failure analysis, fatigue/accelerated life testing
- specialised instrumentation, data acquisition and analysis
- rotating machinery design and troubleshooting:
gearboxes, shafts, bearings, couplings, belts and chains

Company registered in England No. 3284935 VAT Reg No. GB 660 2407 64

JR Dynamics Ltd

Unit 4, Arcot Court,
Nelson Ind. Estate, Cramlington,
Northumberland, NE23 1BB, UK

T +44 (0) 191 58 000 58

E support@jrdltd.com

www.jrdltd.com