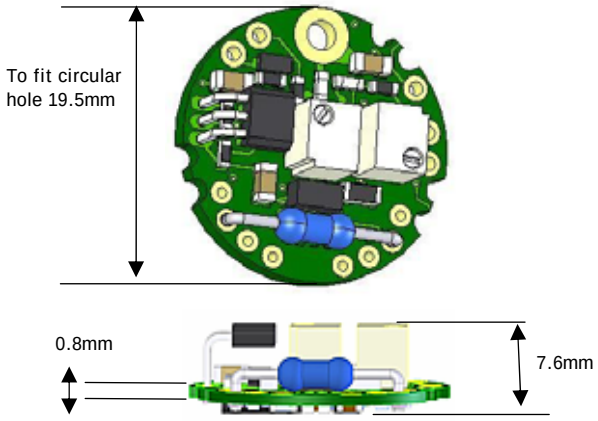
Strain Gauge or Load Cell Embedded Analogue Amplifier

Features

- Standardised mounting hole for faster & easier installation
- New generation improved performance of up to 400% (High Stability version) over operating temperature
- ROHS compliant
- Standardised excitation 5V DC
- Multi layer printed circuit board & additional filtering to improve EMC performance
- Full CE approval
- Plated through holes for wire connections
- Reduced height of just 7.6mm
- New ICA6 model to provide ±10V output from uni-polar 14-24V supply
- Cost effective with attractive discounts on quantity orders & fast delivery times
- Robust design, reverse polarity & short circuit protected
- Fast calibration procedure



Introduction - flexible solution

The second generation ICA (in cell amplifier) is an extremely high performance stain gauge amplifier, converting a strain gauge input to a volt or a mA output. Its sub-miniature design enables it to be fitted into the majority of transducers for a wide range of signal conditioning for strain gauges, load cells, pressure and torque transducers.

The amplifier is available in 6 versions with two performance categories S & H (industrial & very high stability). The ICAH range offers low drift over the operating temperature range.

ICA1,2,3,6 Voltage Output Amplifiers

	ICA1 0.1-10.1V			**ICA2** 0.1-5.1V			**ICA3** ±10V			**ICA6** ±10V			
Parameter	**Min**	**Typ**	**Max**	**Min**	**Typ**	**Max**	**Min**	**Typ**	**Max**	**Min**	**Typ**	**Max**	**Units** *Notes*
Electrical & Environmental													
Supply voltage range	13	24	30	8.5	-	28	±13	-	±15	14	-	18	Volts *Note 1*
Operating current	-	23	-	-	23	-	-	23	-	-	30	-	mA *Note 2*
Operating temp range	-40	-	85	-40	-	85	-40	-	85	-40	-	85	ºC
Storage temp range	-40	-	85	-40	-	85	-40	-	85	-40	-	85	ºC
Reverse polarity protection	-	-	-30	-	-	-30	-	-	-30	-	-	-30	Volts
Measurement													
Bridge excitation	4.9	5	5.1	4.9	5	5.1	4.9	5	5.1	4.9	5	5.1	Volts
Bridge Impedance	330	350	5000	330	350	5000	330	350	5000	330	350	5000	Ohms
Bridge sensitivity	0.5	2.5	150	0.5	2.5	150	0.5	2.5	150	0.5	2.5	150	mV/V *Note 3*
Output voltage range	±0.1		+10.1	+0.1		+5.1	-10		+10	-10		+10	Volts
Output load	5000	-	-	5000	-	-	5000	-	-	5000	-	-	Ohms
Band width	dc	-	1000	dc	-	1000	dc	-	1000	dc	-	1000	Hz
Zero adjustment	-	±2	-	-	±2	-	-	±2	-	-	±2	-	%FR
Span adjustment	-	±8	-	-	±8	-	-	±8	-	-	±8	-	%FR
Linearity	-	0.02	-	-	0.02	-	-	0.02	-	-	0.02	-	%FR
Zero temp stability S		0.0009	0.0025		0.0009	0.0025		0.0009	0.0025		0.0009	0.0025	±%FR/ºC
Zero temp stability H		0.0004	0.0015		0.0004	0.0015		0.0004	0.0015		0.0004	0.0015	±%FR/ºC
Span temp stability S		0.0025	0.0064		0.0025	0.0064		0.0025	0.0064		0.0025	0.0064	±%FR/ºC
Span temp stability H		0.002	0.0051		0.002	0.0051		0.002	0.0051		0.002	0.0051	±%FR/ºC

Notes

Note 1 ICA6 Max Voltage can be increased to 24V with 1000 Ohm load cell.
Note 2 With 350 Ohm load cell connected.
Note 3 Factory setting is the typical value shown. For other values fit an alternative calibration resistor (see manual).

General Notes
The voltage between either of the power supply connections and the load cell shield should not exceed 50V. Any leakage will be greater than 10M Ohms.
FR = Full Range

ICA4,5 Current Output Amplifiers

Parameter	ICA4 4-20mA Min	ICA4 Typ	ICA4 Max	ICA5S 4-20mA Min	ICA5S Typ	ICA5S Max	ICA5A 4-20mA Min	ICA5A Typ	ICA5A Max	Units	Notes
Electrical & Environmental											
Supply voltage range	10	24	30	7.5	24	30	9	24	30	Volts	*Note 1*
Operating current	27	-	43	4	-	20	4	-	20	mA	*Note 2*
Operating temp range	-40	-	85	-40	-	85	-40	-	85	ºC	
Extended operating temp range	n/a	-	n/a	-40	-	125	-40	-	125	ºC	*Note 3*
Storage temp range	-40	-	85	-40	-	125	-40	-	125	ºC	
Reverse polarity protection			-30			-30			-30	Volts	
Measurement											
Bridge excitation	4.9	5	5.1	1.05	1.11	1.16	1.05	1.11	1.16	Volts	*Note 4*
Bridge Impedance	330	350	5000	350	1000	5000	350	1000	5000	Ohms	*Note 5*
Bridge sensitivity	0.5	2.5	150	0.5	2.5	55	0.5	2.5	55	mV/V	*Note 6*
Output current range	4		20	4		20	4		20	mA	
Output load	-	-	250	-	-	800	-	-	800	Ohms	*Note 7*
Band width	dc	-	1000	dc	-	1000	dc	-	1000	Hz	
Zero adjustment	-	±2	-	-	±2	-	-	±2	-	%FR	*Note 3*
Span adjustment	-	±8	-	-	±8	-	-	±8	-	%FR	
Linearity	-	0.02	-	-	0.02	-	-	0.02	-	%FR	
Zero temp stability S		0.0009	0.0025		0.001	0.005		0.001	0.005	±%FR/ºC	
Zero temp stability H		0.0004	0.0015							±%FR/ºC	
Span temp stability S		0.0025	0.0064		0.007	0.014		0.007	0.014	±%FR/ºC	
Span temp stability H		0.002	0.0051							±%FR/ºC	

Notes

Note 1 The ICA4 can tolerate a lower supply voltage if the output load is reduced e.g. operation is possible at 8V provided that the load does not exceed 250 Ohms in sink mode or 150 Ohms in source mode.
Note 2 With 350 Ohm load cell connected (ICA5 1000 Ohm recommended).
Note 3 With reduced supply voltage (see manual).
Note 4 ICA5 with 1000 Ohms load cell connected.
Note 5 ICA5 recommended bridge impedance is 1000 Ohms.
Note 6 Factory setting is the typical value shown. For other values an alternative calibration resistor (see manual).
Note 7 ICA4 only: The maximum load for the ICA4 powered from 12V is 450 Ohms in sink mode and 350 Ohms in source mode. Powered from 24V, the maximum load is 1,000 Ohms.

General Notes

The voltage between either of the power supply connections and the load cell shield should not exceed 50V. Any leakage will be greater than 10M Ohms.
FR = Full Range

CE & Environmental Approvals

Storage temperature	-40 to +85ºC	EMC Emissions	BS EN 55011:1998
Operating temperature	-40 to 85ºC		
Relative humidity	95% maximum non condensing	EMC Immunity	BS EN 61000-42:1995
Safety/Low Voltage Directive	73/23/EEC amended by 93/68/EEC		BS EN 61000-4-3:2002
			BS EN 61000-4-4:2004
EMC Directive	BS EN 61010-1:2001, IEC 1010-1-1990		BS EN 61000-4-11:2004
	89/336/EEC		
	Basic Standard BS EN 61326:1998		