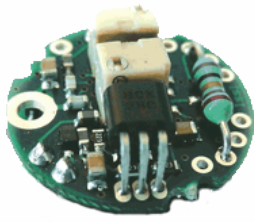


## TYPE: ICA



# ICA 'In-Cell' Analogue Strain Gauge Amplifier

## Description

The second generation ICA (in cell amplifier) is an extremely high performance strain gauge amplifier, converting a strain gauge input to a voltage or current 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 six versions, offering a wide range of current and voltage outputs. All amplifiers have a wide operating voltage range.

## Features

- Standardised mounting hole for faster and easier installation
- Standardised excitation of 5V DC
- Full CE approval
- Plated through holes for wire connections
- Maximum height 7.6mm
- Cost effective with attractive discounts on quantity orders
- Robust design, reverse short circuit protected
- Fast calibration procedure
- Can be integrated into the majority of LCM Systems sensor products

## Typical Applications

- Internal amplification of strain gauge based pressure transducers
- Internal amplification of strain gauge based load cells
- Internal amplification of strain gauge based torque transducers

## Specification - Voltage Output Versions

ICA1 (0.1-10 volts) & ICA2 (0.1 - 5.1 volts) 3 Wire	
Power supply	ICA1: 13 to 28V DC, ICA2: 8.5 to 28V DC
Operating current	22mA (note 1)
Operating temperature range	-40 to +85°C
Storage temperature range	-40 to +85°C
Reverse polarity protection	-30V
Bridge excitation	4.9 to 5.1V
Bridge resistance	350 to 5000Ω (1000Ω typical)
Bridge sensitivity	0.5 to 150mV/V (2.5mV/V typical) (note 2)
Output voltage range	ICA1: +0.1 to +10.1V, ICA2: +0.1 to +5.1V
Output load	5000Ω
Band width	dc to 1000Hz
Zero adjustment	±2%FR
Span adjustment	±8%FR
Linearity	0.02%FR
Zero temp stability	0.0015±%FR/°C
Span temp stability	0.0051±%FR/°C

ICA3 (±10 volts) 4 Wire & ICA 6 (±10 volts) 3 Wire	
Power supply	ICA3: ±13 to ±15V DC, ICA6: 14 to 18V DC (note3)
Operating current	ICA3: 22mA, ICA6: 30mA (note 1)
Operating temperature range	-40 to +85°C
Storage temperature range	-40 to +85°C
Reverse polarity protection	-30V
Bridge excitation	4.9 to 5.1V
Bridge resistance	350 to 5000Ω (1000Ω typical)
Bridge sensitivity	0.5 to 150mV/V (2.5mV/V typical) (note 2)
Output voltage range	-10v to +10V
Output load	5000Ω
Band width	dc to 1000Hz
Zero adjustment	±2%FR
Span adjustment	±8%FR
Linearity	0.02%FR
Zero temp stability	0.0015±%FR/°C
Span temp stability	0.0051±%FR/°C

### 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 10MΩ. FR = full range.

Note 1 With 350Ω load cell connected

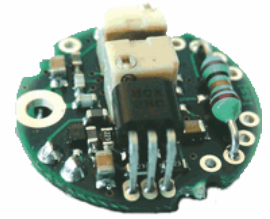
Note 2 Factory setting is the typical value shown. For other values fit an alternative calibration resistor

Note 3 ICA6 maximum voltage can be increased to 24V with 1000Ω load cell

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# ICA 'In-Cell' Analogue Strain Gauge Amplifier



## Specification - Current Output Versions

ICA4 (4-20mA) 3 Wire	
Power supply	13 to 28V DC (24V DC typical) (note 1)
Operating current	26 to 42mA
Operating temperature range	-40 to +85°C
Storage temperature range	-40 to +85°C
Reverse polarity protection	-30V
Bridge excitation	4.9 to 5.1V (note 3)
Bridge resistance	350 to 5000Ω (350Ω typical)
Bridge sensitivity	0.5 to 150mV/V (2.5mV/V typical) (note 2)
Output voltage range	4 to 20mA
Output load	1000Ω (note 3)
Band width	dc to 1000Hz
Zero adjustment	±2%FR
Span adjustment	±8%FR
Linearity	0.02%FR
Zero temp stability	0.0015±%FR/°C
Span temp stability	0.0051±%FR/°C

ICA5 (4-20mA) 2 Wire	
Power supply	7.5 to 28V DC (24V DC typical)
Operating current	4 to 20mA
Operating temperature range	-40 to +85°C
Storage temperature range	-40 to +85°C
Reverse polarity protection	-30V
Bridge excitation	1.05 to 1.16V (1.11 typical) (note 4)
Bridge resistance	350 to 5000Ω (1000Ω typical) (note 5)
Bridge sensitivity	0.5 to 55mV/V (2.5mV/V typical) (note 2)
Output voltage range	4 to 20mA
Output load	825Ω with 24V supply
Band width	dc to 1000Hz
Zero adjustment	±2%FR (note 4)
Span adjustment	±8%FR
Linearity	0.02%FR
Zero temp stability	0.005±%FR/°C
Span temp stability	0.014±%FR/°C

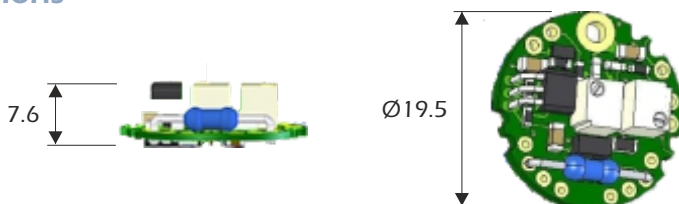
### Notes

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 Ω. FR = full range.

- Note 1 The ICA4 can tolerate a lower power supply voltage if the output load is reduced e.g. operation is possible at 8V provided that the load does not exceed 150Ω.
- Note 2 Factory setting is the typical value shown. For other values fit an alternative calibration resistor
- Note 3 24V minimum supply/sink mode
- Note 4 With 1000Ω load cell connected
- Note 5 Recommend bridge impedance is 1000Ω or greater

All dimensions are in mm

## Dimensions



Due to continual product development, LCM Systems Ltd reserves the right to alter product specifications without prior notice.

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APPROVED

(unapproved if printed)