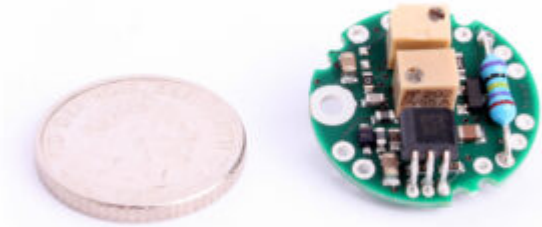# Miniature Load Cell Amplifier | In-Cell Amplifier | ICA

Tiny, High Performance, Fits Inside Your Load Cell

- **Lead Time:** 1 week
- **Buy online:** https://appmeas.co.uk/shop/instrumentation/ica/

AT A GLANCE

- Ø19.5mm x 7.6mm high
- 0-5Vdc, 0-10Vdc, 4-20mA, & ±10Vdc Output Versions
- Low Current Consumption
- Bandwidth: 1kHz max.
- Available with In-Line enclosure for mounting on transducer cable

- **Ideal for when you want a Small Amplifier to Fit Inside Your Load Cell**
- **Compact at Only 19mm Diameter**
- **Can Fit Inside a Wide Variety of Strain Gauge Transducers**
- **6 Different Outputs to Suit Your Exact Application**

DESCRIPTION

The ICA miniature load cell amplifier measures just 19mm in diameter and 7.6mm in height and is designed for incorporation into the body of a broad range of strain gauge transducers and load cells.

When space inside the load cell or transducer is restricted, the ICA miniature load cell amplifier can also be mounted in-line on the transducer cable inside a dedicated enclosure suitable for the application environment. We offer our own compact IP65-rated die cast enclosure the measures just 50mm x 45mm x 30mm which suits most general industrial applications (pictured right).

There are a total of six output variants of the miniature ICA load cell amplifier available:

- ICA1H: 0.1 to 10Vdc (13 to 30Vdc supply)
- ICA2H: 0.1 to 5Vdc (8.5 to 28Vdc supply)
- ICA3H: ±10Vdc (±13 to ±15Vdc bi-polar supply)
- ICA4H: 4-20mA (3-wire) (10 to 30Vdc supply)
- ~~ICA5S: 4-20mA (2-wire) (7.5 to 30Vdc supply)~~ *Currently unavailable*
- ICA6H: ±10Vdc (14 to 18Vdc supply)

We hold stock of all the miniature load cell amplifier models mentioned above for immediate despatch.

❝ The high speed, reliability and clean output of the ICA4H miniature amplifier enabled the data to be analysed immediately after each test.

- Andy Hall, Director, 4c Engineering Miniature Load Cell Amplifier | In-Cell Amplifier | ICA July 9, 2018

TECHNICAL SPECIFICATIONS

Characteristics	ICA1H	ICA2H	ICA3H	ICA4H	ICA6H	ICA5S	Units
Output Range:	0.1 to 10.1 Vdc	0.1 to 5.1 Vdc	0 to ±10Vdc	4 to 20mA	0 to ±10Vdc	4 to 20mA	See opposite
Minimum Output: not on Mantracourt spec	0.07Vdc	0.07Vdc	0Vdc	3.8mA	0Vdc	3.8mA	See opposite
Number of Connections: not on Mantracourt spec	3	3	4	3	3	2	See opposite
Mode of Operations:	Uni-directional	Uni-directional	Bi-directional	Uni-directional	Bi-directional	Uni-directional	See opposite
Power Supply: Minimum	13	8.5	±13	10 (Note 4)	14 (Note 3)	7.5	Vdc
Typical	24	12	±14	24 (Note 4)	15 (Note 3)	24	Vdc
Maximum	30	28	±15	30 (Note 4)	18 (Note 3)	30	Vdc
Operating Current: Typical	22 (Note 1)	22 (Note 1)	22 (Note 1)	Min 26, Max 42 (Note 1)	30 (Note 1)	4 to 20	mA
Bridge Excitation Voltage:	5±0.1	5±0.1	5±0.1	5±0.1	5±0.1	1.1 nom (Note 5)	Volts
Bridge Resistance: Min	350	350	350	350	350	350 (Note 6)	Ohms
Typ	1000	1000	1000	1000	1000	1000 (Note 6)	Ohms
Max	5000	5000	5000	5000	5000	5000 (Note 6)	Ohms
Bridge Sensitivity (Note 2): Min	0.5	0.5	0.5	0.5	0.5	0.5	mV/V
Typ	2.5	2.5	2.5	2.5	2.5	2.5	mV/V
Max	150	150	150	150	150	55	mV/V
Minimum Resistance across Output:	5000	5000	5000	1000	5000	800	Ohms
Maximum Loop Resistance: not on Mantracourt spec	N/A	N/A	N/A	250	N/A	800	Ohms
Output Bandwidth:	1000						Hz
Zero Adjustment:	±2	±2	±2	±2	±2	±2 (Note 5)	%FSO
Span Adjustment:	±8	±8	±8	±8	±8	±8	%FSO
Output Linearity:	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	±%FSO
Zero Temp Coefficient: Typ	0.0004	0.0004	0.0004	0.0004	0.0004	0.001	±%FSO/˚C
Max	0.0015	0.0015	0.0015	0.0015	0.0015	0.005	±%FSO/˚C
Span Temp Coefficient: Typ	0.002	0.002	0.002	0.002	0.002	0.007	±%FSO/˚C
Max	0.0051	0.0051	0.0051	0.0051	0.0051	0.014	±%FSO/˚C
Operating Temperature Range:	-40 to +85						˚C
Storage Temperature Range:	-40 to +85						˚C
Reverse Polarity Protection:	-30						Vdc
Maximum Relative Humidity:	95						% non-condensing
Connection Method: not on Mantracourt spec	Plated through holes						
Note 1: With 350 Ohm load cell connected.							
Note 2: Factory setting is the typical value shown. For other values fit an alternative calibration resistor.							

Characteristics	ICA1H	ICA2H	ICA3H	ICA4H	ICA6H	ICA5S	Units
Note 3: ICA6 maximum voltage can be increased to 24V with a 1000 Ohm load cell.							
Note 4: 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 150 Ohm.							
Note 5: ICA5 with 1000 Ohms load cell connected.							
Note 6: ICA5 recommended bridge impedance is 1000 Ohms or greater.							

Product Dimensions

ICA Amplifier   Optional ICA Enclosure
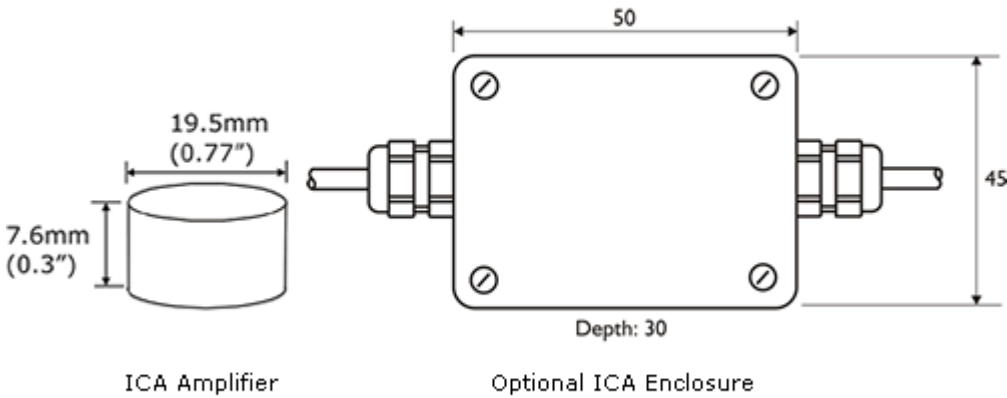
ORDERING CODES & OPTIONS

| Core Product	Supply Voltage	Example Result
ICA	0.1 to 10.1Vdc / 13 to 30Vdc	ICA1H
ICA	0.1 to 5.1Vdc / 8.5 to 28Vdc	ICA2H
ICA	0 to ±10Vdc / ±13 to ±15Vdc	ICA3H
ICA	4 to 20mA (3-wire) / 10 to 30Vdc	ICA4H
ICA	4 to 20mA (2-wire) / 7.5 to 30Vdc	ICA5S
ICA	0 to ±10Vdc / 14 to 18Vdc	ICA6H

CASE STUDIES
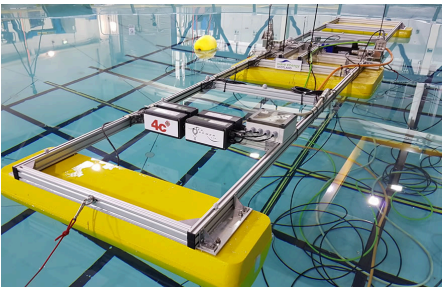
Real Life: Power Take-Off Torque Monitoring – Accurate, Fast and Simple!

Read the real life case study of power take-off torque monitoring on the Wave Energy Converter The SeaPower Platform. See how our complete torque measuring system enabled engineers to accurately monitor the torque applied by the Wave Energy Converter as it responded to waves in the test tank with accurate, fast and reliable results.

Read more... (https://appmeas.co.uk/blog/power-take-off-torque-monitoring/)
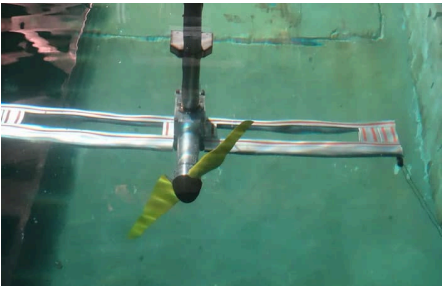
Submersible Load Cells Lower the Cost of Large Tidal Turbine Designs

This case study aims to significantly reduce the cost of large scale tidal turbine designs using our submersible load cells. The tidal turbine test rig was placed in a state-of-the-art test tank, where the team were able to increasing the size, flow rate and turbulence levels within the tank. Lowering the cost of rotor blade manufacture would make this renewable energy more economical to use and widely accessible, benefiting not only the UK renewable tidal energy markets but developing tidal energy countries too. Our submersible load cells measured both the torque and the thrust of the underwater tidal turbine design.

Read more... (https://appmeas.co.uk/blog/submersible-load-cells-for-tidal-turbine-design/)

Our Shear Pin Load Cells and Draw Wire Sensors Deliver Flawless Results in Sub-Zero Temperatures

Applied Measurements were contacted by Victoria University of Wellington to provide reliable and accurate equipment that could operate in the sub-zero temperatures of the Antarctic. Using Applied Measurements' two customised DBEP shear pin load cells, a WS12 draw wire sensor and four intuitive2 displays, the RICE team were able to successfully extract a 763m deep ice core from an ice cap on Roosevelt Island.

Read more... (https://appmeas.co.uk/blog/flawless-results-sub-zero-temperatures/)

Applied Measurements' Submersible Load Cells fitted to the World's Largest All-Terrain Hexapod

Applied Measurements provided the load cells needed to monitor the force on individual legs to stop the Mantis (the world's largest hydraulic hexapod robot) walking into a situation that is hazardous to its overall stability. Assisted by Applied Measurements' compact and submersible DSCC load cells, the Mantis successfully travels over all slopes and uneven surfaces, traversing most types of terrain, even wading through water.

Read more... (https://appmeas.co.uk/blog/applied-measurements-submersible-load-cells-worlds-largest-all-terrain-hexapod/)

Load Pins and Position Sensors used for Antarctic Research

Applied Measurements needed to design and manufacture a pair of custom load pins for the university that could compensate for temperatures as low as -30degC. The load pin also had a built in ICA4S amplifier that could give a 4-20mA output for them to use to monitor the drilling forces.

Read more... (https://appmeas.co.uk/blog/load-pins-position-sensors-antarctic-research/)

RELATED PRODUCTS

Buy Online

Strain Gauge Displacement Sensor | Linear Position Sensor | AML/SGD
0-5mm to 0-100mm
From **£425**

Load Cells & Force Sensors

Torque Transducers & Torque Sensors

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