

# Amber Instruments Ltd

## LCA15 & LCB In Line Intelligent Strain Gauge Amplifier



### Introduction

The intelligent Strain Gauge amplifier offers both 4 to 20mA and 0 to 10 volt analogue outputs, from any standard Strain Gauge input. 1 pass calibration and setting of the analogue output range, make the unit

extremely user friendly; being set up by a simple hand held or on board programmer/display. Auto Tare and Peak Hold (if set) on the analogue output are operated via volt free contact closures.

### Features

- Variable gain Strain Gauge sensitivity from 0.5 to 200mV/V
- Simple one pass Auto Calibration
- Auto Tare
- 4-20mA and 0-10V outputs
- 10V @ 160mA excitation to drive up to 6/350 ohm Strain Gauges
- High accuracy
- Low drift
- Wide range of power supplies
- IP65 surface mounting case
- Isolated analogue outputs
- 10 years data retention
- Digital programming, calibration & display

### Output options include

- **Relay Set Points**  
Programmed in engineering units, with In Flight compensation and Hysterisis Settings available for control or alarm purposes.

- **Communications**  
To read any value, change set points or any other parameter via:  
20mA Current loop (LC1)  
RS232/RS485 (LC3)  
Format MANTRABUS, ASCII, MODBUS, RTU

- **Printer**  
Activated by a contact closure, displays the current live value, with header message, engineering units, auto incrementing batch number and a real time if required.

**Options**

- 9-32V DC power supply (LS3)
- Stainless Steel case sealed to IP65 (LSS)
- Available without its case as a separate Eurocard PCB assembly (LCB)

### Intelligent Strain Gauge Amplifier

The Strain Gauge amplifier is housed in a light grey ABS case, sealed to IP65 with external dimensions of 200 x 120 x 75mm

The unit comprises an intelligent base unit with 4-20mA and 0-10V analogue outputs, and plug in module positions for the power supply, relay and communications options.

The AC power supply is a selectable 115 or 230V AC. Connections for input, output and power supply are through cable glands sealed to IP65. Internal 2.5mm screw field terminals are provided.

### The Unit offers

#### Calibration

A simple 1 Pass Auto Calibration is achieved by entering the values of the lowest and highest weights used. Analogue output is pre calibrated and can be set over any part of the displayed range.

Both input and output are calibrated by use of the programmer module.

The programmer defaults to weight display to ease calibration checks.

Auto Tare (zero) and Peak Hold are actioned by volt free contacts.

### Input Details

The input is of the Load Cell/Strain Gauge type. With transducer excitation voltage of 9.6 volts @ 160mA to drive 6 x 350R bridges.

Compensation by  $\pm$  sense wires for cable and safety barrier losses down to 3V excitation.

Load cell sensitivity is preset via DIL switches to 0.5, 0.8, 1.0 1.25, 1.5, 2.0, 2.5, 3.5, 5, 10, 20, 50, 100 or 200mV/V.

Initial offset is no greater than  $\pm 0.15$ mV (15 $\mu$ V/V) which is cancelled during auto calibration.

Speed	Up to 10 readings per second with a digital filter to reduce speed.
Accuracy/Repeatability	Up to 90 days $\pm 0.08\%$ of reading, $\pm 0.05\%$ FSD typical
Drift	Up to 0.002% per degree C @ 2.5mV/V typical
Resolution	15 bit.
Contact inputs	available for auto tare, print and peak hold reset (volt free).

## Analogue Outputs

Drive	4-20mA up to 1Kohm and 0-10 volts up to 2mA.
Accuracy	4-20mA $\pm 0.15\%$ of range, typical. 0-10V $\pm 2\%$ before calibration.
Resolution	as for display up to 13 bits. Settling time 0.25 secs to 1% of step change.
Isolation	$\pm 130V$ RMS or DC max to analogue input or any other port.

### Data Retention/Protection

Retention:	10 years for set up values, minimum of 100,000 write cycles.
Protection of data and function(s):	Watchdog timer giving repeat auto resets. Impending power failure detection and hold off. Keypad security and time out.

### Options Available

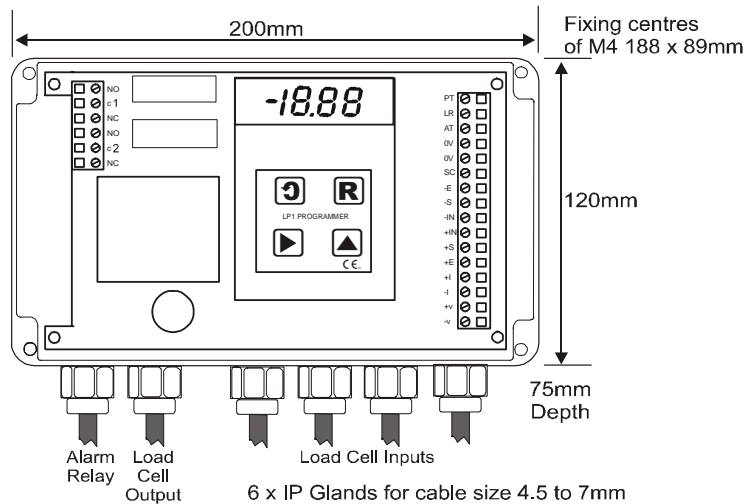
2 set points Communications Port	Output through 5A, 230V AC SPNO relays, with a latching option For data transfer or print via :-
20mA loop	Enabling up to 254 units to be multi dropped to 1 x RS232 via IF25interface(s) (isolated).
RS485	Enabling up to 32 units to be multi dropped (isolated).
RS232	For 1 to 1 connection and standard printer drive (isolated).
Printer Operation	By closure of volt free contact.
Baud Rates	300, 600, 1200, 2400, 4800, 9600 (19200 MANTRABUS only)
Die Cast Case	Sealed to IP65 with external dimensions of 220 x 120 x 80mm max
Stainless Steel Case	Sealed to IP65, with external dimensions of 224 x 160 x 90mm
DC Powering	9-32V dc
PCB Only (Eurocard) (LCB)	100 x 160 X 57mm for rack or customers enclosure

### Physical

PCB Case Dimensions	120 x 200 x 75mm (without glands, see diagram below)
Case	ABS

### CE & Environmental Approvals

Storage temperature	-20 to +70°C
Operating temperature	-10 to 50°C
Relative humidity	95% maximum non stop condensing
Safety/Low Voltage Directive	73/23/EEC amended by 93/68/EEC To IEC 1010-1:1990, EN 61010 - 1 - 1993
EMC Directive	EN 50 081 - 1 : 1992 (Light Industrial)
Emissions	EN 50 081 - 2 : 1992 (Heavy Industrial)
	EN 50 082 - 1 : 1992 (Light Industrial)
EMC Immunity	EN 50 082 - 2 : 1992 (Heavy Industrial)



Clearance above the top of LS1 ac power supply 52mm

Clearance above the top of keypad 50mm

Clearance above the top of LS3 dc power supply 42mm

Clearance below the LCB 3mm, but needs to be insulated to allow 6mm



Dunston House, Dunston Road, Chesterfield, Derbys, S41 9QD  
 Tel: 01246 260250 Fax: 01246 260955  
 e-mail: sales@amberinstruments.com web: www.amberinstruments.com

Torque Transducers, Load Cells (general purpose, weighing & fatigue rated). Multi-Axis Force/Torque, Weighing Instruments, Process Instruments, Portable Data Loggers, Pressure Sensors, Proximity Sensors, Laser (Distance Measuring) Sensors, & more.