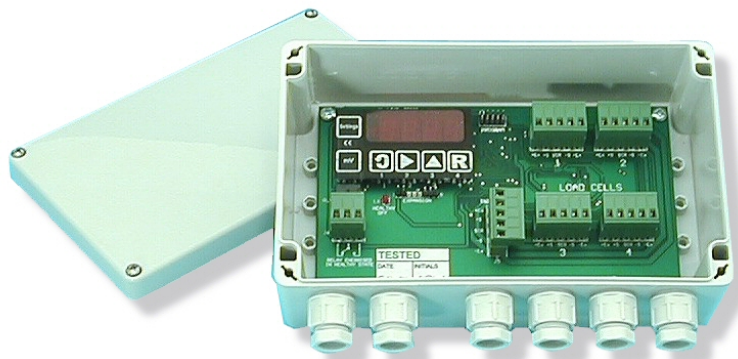


JBOX LCI

Load Cell Integrity Alarm & Junction Box



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1. INTRODUCTION TO THE JBOX LCI

SENSY have introduced the low cost Load Cell Integrity Alarm and Junction box, to provide connection between 1 and 4 load cells to a weighing system, creating a means of constantly monitoring the condition of individual load cells.

Continuous diagnosis of fault conditions prevents the incorrect weighing of product and the subsequent technical and commercial problems resulting from such situations.

The benefits of the junction box are that any load cell malfunction is immediately reported by an alarm condition, avoiding incorrect material levels so that there is the continued assurance of correct product quantities.

The avoidance of batch wastage or product recall, reduction in plant downtime and increased safety, together with aids for installation and commissioning; all contribute to the JBOX LCI becoming an essential element for all weighing systems.

An on board microprocessor provides for a high level of intelligence, the JBOX LCI is therefore able to offer a useful range of features:

1. Load detection; An alarm contact will change state, the Red Alarm LED will indicate and the display will show the load cell in error and the error code.

An error is detected in any of the following occur:

- One or more of the load cells are out of balance with the pre-set error band.
- Any load cell is operating outside its pre-set range
- The load cell excitation voltage drops
- Any of the load cells become open or short circuit

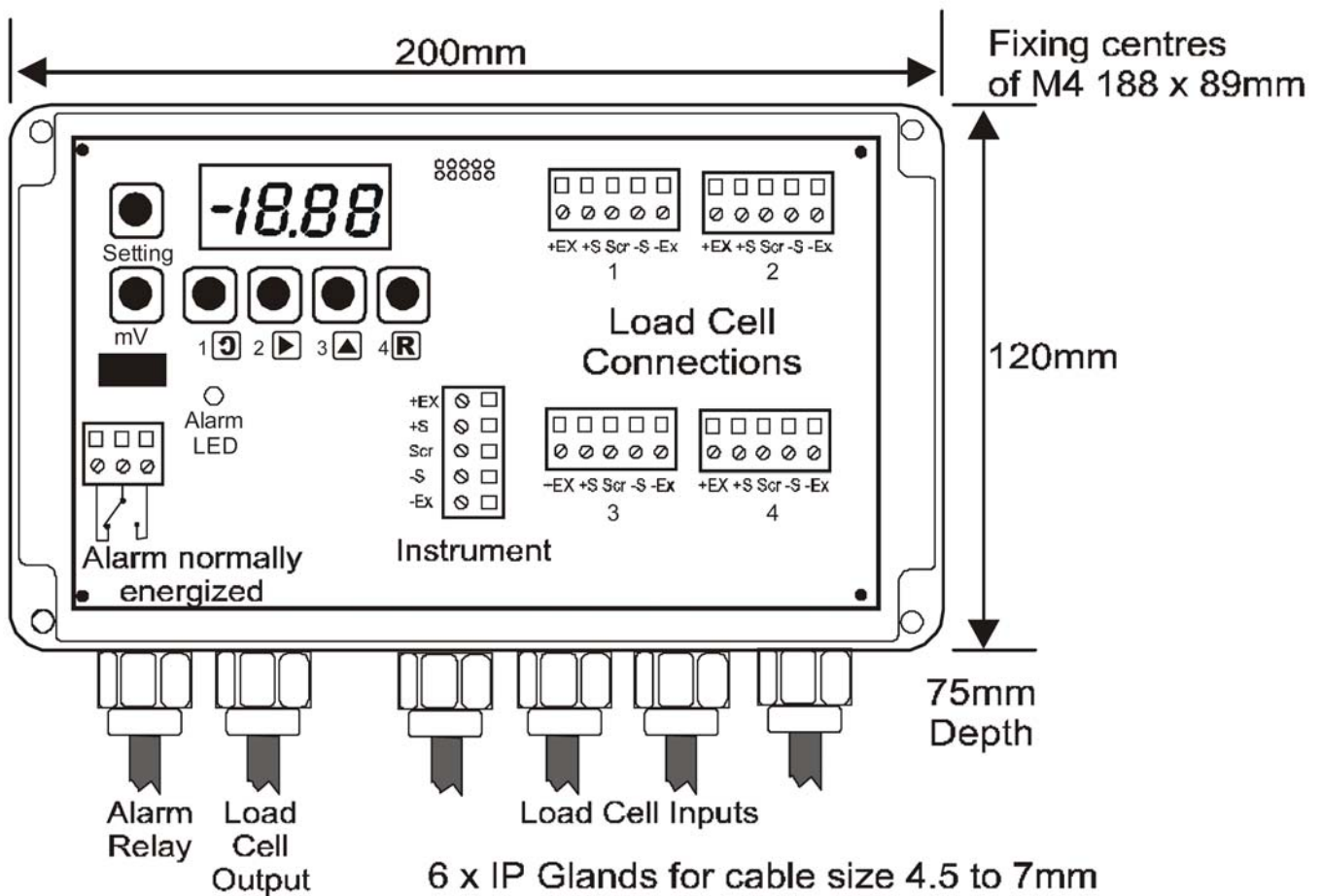
2. A display of the mv/v value of each load cell, or the average of the summated mv/v value of all the load cells.

3. The JBOX LCI can replace any standard junction box. Options are available for the provision of an RS485 communications port or one of Sensy's telemetry links.

2. INSTALLING THE JBOX LCI

The JBOX LCI is provided as single PCB unit, prepared with 4 fixing centers to accommodate M4 screws. Case options are IP65 ABS (as standard), Stainless steel, or DIN rail mounting. Installation of the JBOX LCI is simplified by the provision of separate, 2 part plug-in connectors for each of the load cell cables, the indication I/O and alarm relay.

Connection details are shown in the diagrams below:



Important Note:

If connecting less than 4 load cells to the JBOX LCI start at connector block 1, then 2, 3 and through to 4.

3. SETTING UP THE JBOX LCI

The JBOX LCI features a 4 digit Red LED display, where all the various conditions are displayed and 4 programming keys.

On 'Power Up', the display will show either 'good' or display an Error e.g. '1Er5'

Which refers in this example, to Load Cell No.1 with error No.5

3.1. Sequence of Operations / Programmer Keys



Used to scroll through and change the set up data by displaying mnemonics for each configurable parameter, followed by the appropriate data.



Selects the display digit required. Selection value is indicated by a flashing digit.



Increments each selected display digit 0-9.



Resets the display to the input variable and enters new data in the JBOX LCI memory.

If during the programming sequence, selection is not completed, the display will revert to the status message after 2 minutes.

3.2. Password Protection

A 4 digit password number must be entered. The number is accessed when 'PASS' is displayed. At this point, it is necessary to enter the factory set number (contact supplier).

3.3. Configurable Parameters

Code	Range	Function
P A S S	(contact supplier)	Security password
n o r c	1 to 4	Number of load cells
L o r r	± 50.00	Load cell operating range Minimum (see 1)
H l r r	± 50.00	Load Cell operating range Maximum (see 2)
b A L	± 50.00	Permissible Error band between load cells (see 3)
R L t	0 to 999.9	Time before Alarm trip, set in seconds (see 4)

1. This is the lowest operating level (in mV) of any load cell connected. The alarm will activate if any load cell falls below this value.
2. This is the highest operating level (in mV) of any load cell connected. The alarm will activate if any load cell exceeds this value.
3. This is the permissible difference (in mV) between any 2 load cells. The alarm will activate if this value is exceeded.
4. This is the time (in seconds) an error must be present before the error alarm is displayed and output via the relay.

3.4. The Error Displays on the JBOX LCI

Note: On Power Up the display will show either 'good' or ('Er'). Listed below is the range of errors, which could occur, due to fault conditions on the weighing system load cells and associated wiring. Display digit 1 shows which load cell is in error. Digits 2 and 3 show an error by displaying 'Er'.

Display digit 4 displays any of 5 fault conditions as follows:

Er 1 Error Condition 1

An open or short circuit on the load cell or connectors (Check wiring and power supply)

Er 2 Error Condition 2

The load cell input is open circuit or exceeded ± 50 mV (Check wiring and power supply)

Er 3 Error Condition 3

Operating outside the pre-set maximum and minimum range (Lor | Hir)
(Check wiring, cell mounting, Max /Min operating ranges)

Er 4 Error Condition 4

The load cell balance has exceeded the pre-set balance band (bAL)
(Check wiring, cell mounting, Error band values)

Er 5 Error Condition 5

Open circuit of the excitation on the load cell or connectors (Check wiring)

Notes:

1. An open or short circuit may cause multiple errors. The display will cycle through multiple errors, displaying each code for 1 second.
2. To locate faults, start with the load cell, which displays the most errors.
3. The 'SETTINGS' button to step through the parameters and their values
4. A healthy unit will show red LED 'OFF', fault condition 'ON'

3.5. The Millivolt Display readings on the JBOX LCI

To view the average of all of the load cell signals, press the 'mV' button.

To view the individual load cell signals, hold down the 'mV' button, and at the same time press the buttons, 1 to 4 to select each load cell required.

4. THE SPECIFICATIONS AND PARAMETERS OF THE JBOX LCI

4.1. Specifications

<i>Faults Monitored</i>	Load Cell out of preset balance range Load Cell out of pre-set operating range Low/high excitation Open circuit to any load cell on each connection Short circuit on any load cell connection Internal load cell fault (Bridge Imbalance)
<i>Powering Indication</i>	By Load Cell Excitation typically 10v DC 1 x 4 digit 7 segment LED display for set up, load cell in error type & individual total mV outputs
<i>Setting Method</i>	6 buttons for reading & set up
<i>Connections</i>	2 part terminals, up to 2.5mm ² cable 4 x 5 way, for load cell connection 1 x 5 way, load cell output 1 x 3 way, alarm relay contacts
<i>Dimensions</i>	200 x 120 x 75mm. (PCB dimensions 170 x 100mm excluding mounting material)
<i>Environmental</i>	Sealed to IP65 with cable glands & blanking plugs fitted CE Compliance.
<i>Enclosure Material</i>	Grey ABS

4.2. Parameters

	Min	Typical	Max	Units
Power supply volts from excitation supply	9	10	12	Vdc
Power supply current from excitation supply 1		43	52	mA
Bridge excitation 350R load cell	8	10	12	V
Bridge resistance (typically 350-700R) each	300	350	1000	Ohms
Bridge sensitivity	1.0	2.0	5.0	mV/V
Bridge No selectable	1		4	Bridges
Output load	1M		100G	Ohms
Bandwidth of Junction Box		100		Hz
Zero temperature co-efficient of Junction Box @ 2mV/V	-0.0005	0	0.0005	%V/° C
Span temperature co-efficient of Junction Box	-0.0005	0	0.0005	%/° C
Linearity of Junction Box	-0.0015	0	0.0015	%FSD
90 day Stability of Junction Box	-0.001	0	0.001	%
90 day Stability of Junction Box	-0.001	0	0.001	% FSD
Operating temperature range	-40		85	° C
Storage temperature range	-40		95	° C
Humidity		95		%
Scan Speed for alarm output (4 cells)		40	100	ms
Display, Range	-50.00		+50.00	mV
Relay contacts SPCO normally energized			500	mA
Relay contacts SPCO normally energized			50	V
Alarm operating speed for less than 1mV change		100		ms
mV measurement accuracy individual cell	-15		+15	%
mV accuracy average reading	-2		+2	%

4.3. CE and Environmental Approvals

EMC Directive 89/336/EEC
EMC Emissions
EN 50 081-1 :1992 (Light Industrial)
EN 50 081-2 :1992 (Heavy Industrial)

EMC Immunity
EN 50 082-1 :1992 (Light Industrial)
EN 50 082-2 :1992 (Heavy Industrial)
Low Voltage Directive 73/23/EEC amended by 93/68/EEC
IEC 1010-1 :1990
BSEN 610101 :1993

4.4. Wiring Conditions

Load Cell and indication (instrument) cable connections should use individually screened twisted multipair cables (e.g. FE585 – 646)
Terminate all screens at SCR. SCR should be connected to a good Earth. The earth connection should be of sufficient cross sectional area to ensure a low impedance to attenuate RF interference.