

WeightSense™ OM-232-D
Digital Signal Conditioner w/ Display
Operation Manual



Load Cell Central
1-800-LOADCEL

PO Box 91, 216 Main St.
Monroeton, PA 18832
Tel: (570) 265-5015, Fax: (570) 265-5148
www.800loadcel.com

WARRANTY AND LIMITATION OF LIABILITY

All equipment, software, and documentation is sold subject to the mutual agreement that it is warranted by the company to be free from defects of material and workmanship but the company shall not be liable for special, indirect or consequential damages of any kind under this contract or otherwise. The company's liability shall be limited exclusively to replacing or repairing without charge, at its factory or elsewhere at its discretion, any material or workmanship defects which become apparent within one year from the date on which the equipment was shipped, and the company shall have no liability of any kind arising from the installation and/or use of the apparatus by anyone. The buyer by the acceptance of the equipment will assume all liability for any damages which may result from its use or misuse by the buyer, his or its employees, or by others.

The warranties of the company do not cover, and the company makes no warranty with respect to any defect, failure, deficiency or error which is:

- A) Not reported to the company within the applicable warranty period; or
- B) Due to misapplication, modification, dis-assembly, abuse, improper installation by others, abnormal conditions of temperature, dirt, or corrosive matter; or
- C) Due to operation, either intentional or otherwise, above rated capacities or in an otherwise improper manner.

The company believes that the information in this manual is accurate. The document has been carefully reviewed for technical accuracy. In the event that technical or typographic errors exist, the company reserves the right to make changes to subsequent editions of this document without prior notice to holders of this edition. The reader should consult the company if errors are suspected. In no event shall the company be liable for any damages arising out of or related to this document or the information contained in it.

There are no other warranties, express or implied including the implied warranties of merchantability and fitness for a particular purpose.

COPYRIGHT

Under the copyright laws, this publication may not be reproduced or transmitted in any form, electronic or mechanical, including photocopying, recording, storing in an information retrieval system, or translating, in whole or in part, without the prior consent of RDR Technology, Inc. dba Load Cell Central.

© November 30, 2007 RDR Technology, Inc. Load Cell Central.
All rights reserved.

CONTENTS

WARRANTY AND LIMITATION OF LIABILITY.....	2
COPYRIGHT	2
CONTENTS.....	3
INTRODUCTION.....	4
WEIGHTSENSE™ OM-232-D QUICKSTART	5
INSTALLATION AND START UP	7
COMMUNICATIONS METHOD.....	7
RUN MODE.....	8
DATA MEASUREMENT	8
TARE AND RESET	8
WEIGHTSENSE™ SETUP OPTIONS.....	8
<i>TEDS Tag®/Auto ID</i>	8
<i>Temperature Compensation</i>	8
SENSOR SETUP OPTIONS.....	8
<i>LCD Display Labeling</i>	9
<i>Filtering</i>	9
<i>Analog Output</i>	9
CALIBRATION MODE.....	10
TECHNICAL INFORMATION/CUSTOMER SUPPORT	10
APPENDIX A – SPECIFICATIONS	11
<i>Excitation</i>	11
<i>Operation</i>	11
<i>Outputs</i>	11
<i>Power</i>	11
<i>Mechanical</i>	11
APPENDIX B – WEIGHTSENSE™ CABLES AND CONNECTORS	12
APPENDIX C – BRIDGE CONNECTION DIAGRAMS	13



Under the copyright laws, this publication may not be reproduced or transmitted in any form, electronic or mechanical, including photocopying, recording, storing in an information retrieval system, or translating, in whole or part, without the prior consent of RDR Technology, Inc. dba Load Cell Central Copyright November 30, 2007 all rights reserved.

INTRODUCTION

The WeightSense™ OM-232-D is a versatile precision instrument intended for the digital readout of strain-gauge sensors such as load cells and extensometers. It can be used with the ScaleWatch LITE graphical user interface software.

Here is a quick listing of its features:

- Communications to and from the WeightSense™ can use either **RS-232** or **RS-485** protocol.
- **16 character LCD Display** with 4 character settable label for the active sensor.
- **Shunt** button can be used to close the shunt relay and take a reading when connected to an analog display.
- **Tare** button can tare readings when connected to an analog display.
- ScaleWatch LITE™ allows for the measurement **load, peak, and valley** in various English and metric units. User-defined units are also supported in the GUI software.
- ScaleWatch LITE™ allows data storage directly to PC that is compatible with Excel spreadsheets
- ScaleWatch LITE™ allow the user to Tare readings at any point when data is streaming from the WeightSense™.
- The WeightSense™ supports the **calibration of up to three sensors**. Calibration data is stored in the WeightSense™. ScaleWatch LITE™ allows the user to calibrate various types of strain-gauge sensors.
- **Calibration** for sensors can be done using manufacturer's milli-volt per volt calibration factor, 2 or 6 point known mass, or internal precision shunt calibration.
- Two latching solid state **relay switches** are available to for use ScaleWatch LITE™.
- **Automatic identification** of calibrated load cells with TEDS-Tag®.
- **Analog output** of either a set voltage or a voltage tied to the sensor reading with user defined scale factor and offset. Wide range, buffered ± 10.00 volt output.
- Other functions available as custom programmed options.

WEIGHTSENSE™ OM-232-D QUICKSTART

This section will help you get your WeightSense™ set up and operating in just a couple of minutes. WeightSense™ hardware provides DC excitation that is suitable for strain-gauge and resistive bridges.

WeightSense™ Front Panel



Shunt Button: Pressing on the Shunt Button closes the shunt switch, connecting 60K Ω resistor in the WeightSense™ in parallel with the strain-gauge. Re-pressing the Shunt Button will open up the shunt switch. The position of the shunt switch can also be determined by the LED color in run mode. If the shunt switch is closed, the LED will be red. Otherwise, it will be green. In calibration mode, the Shunt Button should not be used. If pressed, it will be ignored.

Tare Button: Pressing on the Tare Button will tare the sensor reading in run mode. The Tare Button is not used in calibration. If pressed, it will be ignored.

The side panel is shown below. You will need to make at least three connections here. Connect the AC power 120/240 VAC 60/50 Hz into the included power adapter then connect the output of the adapter into the WeightSense™ Power connector.



WeightSense™ Side Panel

Next connect a sensor to the 9 pin male connector labeled “Sensor”. You should use the cabling supplied with your WeightSense™. If you do not have a factory supplied cable see Appendix B for the recommended connection.

Connect the serial cable from the serial port of the PC to the Serial port on the front panel. Optionally, you may also connect an analog input device to the Analog port. The Analog port will generate a $\pm 10V$ signal proportional to the sensor reading. The analog port can also be configured to output a user-defined voltage. See the ScaleWatch LITE™ software manual for programming details.

You are now set up to use ScaleWatch LITE™ to add, calibrate and read data from strain-gauge load cells.

INSTALLATION AND START UP

When the WeightSense™ is powered, the LED on the top panel will first turn either orange or purple, and then green. The first two colors indicate the communications method of the WeightSense™: orange is for RS-232 (for use with ScaleWatch LITE™), purple is for RS-485 (for use with a digital device). The factory default communications mode is RS-232 unless otherwise requested.

Communications Method

See what method the unit is currently using. To do this, power up the WeightSense™ and see which color the LED is before it turns green. If the color is orange, the unit is in RS-232 mode. If the color is purple, the unit is in RS-485 mode.

To change the mode, cycle the power and, upon power up, hold the Shunt button down. This will toggle the unit between RS232 and RS485 modes. Keep the button depressed until the LED shows the color of the mode opposite the mode the WeightSense™ is in (i.e. if the WeightSense™ is currently in RS-232, holding the button on power up will place it in RS-485 mode and the LED will show purple). The LED will then turn green, indicating that the WeightSense™ is in run mode. Release the Shunt button.

RUN MODE

The WeightSense™ has two modes of operation, each discernable by looking at the color of the LED on the top of the WeightSense™: Run mode, and System Calibration mode. At power-on it will be in Run mode. The LED is green when the WeightSense™ is in Run Mode and blue when the WeightSense™ is in Calibration Mode.

With the use of ScaleWatch LITE™, the user can perform various tasks when the WeightSense™ is in Run Mode:

Data Measurement

Measure and track, the peak and valley from a given, calibrated sensor. The WeightSense™ supports load units of Lbs and Kg, as well as extension units of In, cm, and mm. Either sensor type can also send data as a percentage of a given base load/extension. ScaleWatch LITE™ adds to these units and can be customized to meet user needs. ScaleWatch LITE™ also has a user-defined unit option that allows the user to create their own unit of measurement by applying a 5th order polynomial to the data.

Tare and Reset

ScaleWatch LITE™ software allows the user to command the WeightSense™ to tare track data and reset peak and valley measurements.

WeightSense™ Setup Options

While the WeightSense™ is in Run Mode, the user can, with the use of ScaleWatch LITE™ software, name the WeightSense™ with four characters that the WeightSense™ stores, enable and disable TEDS Tag®/Auto ID of sensors, and enable or disable the WeightSense's™ internal temperature compensation.

TEDS Tag®/Auto ID

The WeightSense™ is capable of recognizing a sensor that has been calibrated on the WeightSense™ when that sensor is plugged into the WeightSense™. This is true only if the sensor has been calibrated in one of the three sensor “slots” within the WeightSense™ and has not been overwritten with another sensor calibration.

Temperature Compensation

The WeightSense™ has the ability to compensate for temperature that may affect data readings. By default, temperature compensation is set to ON in the factory unless otherwise requested.

Sensor Setup Options

Each of the three sensor “slots” within the WeightSense™ can store calibration data, but they can store sensor-specific settings in the WeightSense™ via ScaleWatch LITE™.

This includes **labeling a sensor on the LCD Display**; filtering, display decimal points (the WeightSense™ will use this to output data to an attached digital display if that option has been purchased), analog output settings if analog output is tied to the sensor output, and the base value to use when track data is in units of %.

LCD Display Labeling

The WeightSense™ uses the first four characters of the LCD Display for a user-settable label. The default label will show the active sensor (sensor 1, 2, or 3) and channel and has the format s<active sensor>c<channel>, i.e. s2cA. In a single channel WeightSense™, the channel will always be A. The user can change this label to any other four characters/digits through **ScaleWatch LITE™** software.

Filtering

The WeightSense™ can perform moving average filtering of data using up to 128 data points.

Analog Output

The user can set the range of voltage the WeightSense™ outputs in response to the sensor stimulus. This allows the user to set any maximum and minimum voltage and offset so that the analog output can be scaled to match the input requirements of nearly any data acquisition system. This includes single ended and bipolar outputs.

CALIBRATION MODE

The unit's LED turns blue when the WeightSense™ is placed in calibration mode OR when an address check is sent to it via ScaleWatch LITE™. If the WeightSense™ is in calibration mode, the LED will stay blue. If an address check was sent, as is done by ScaleWatch LITE™ to monitor the connection to the WeightSense™, the LED will flash blue and return to green for run mode.

Once in calibration mode, sensors can be calibrated using their manufacturer's mV/V constant, two or six point Mass, or precision shunt calibration. ScaleWatch LITE™ steps the user through the calibration process for each sensor.

There are three sensor "slots" within the WeightSense™ that can hold these calibrations. Calibration data is maintained in the WeightSense™ through power cycle.

Once a sensor has been calibrated, the WeightSense™ must be commanded to stream data to the ScaleWatch LITE™ software. Streaming data, test conditions, and storing of test data are all handled by ScaleWatch LITE™. Speak to your Load Cell Central sales representative for more information on ScaleWatch LITE™.

TECHNICAL INFORMATION/CUSTOMER SUPPORT

For Technical Support or Customer Service for any Load Cell Central product, call or contact RDR Technology, Inc. dba Load Cell Central, PO Box 91, 216 Main St., Monroeton, PA 18832, phone: 570-265-5015.

APPENDIX A – SPECIFICATIONS

Excitation

Voltage: 5 VDC

Nom. Load: 350 Ω

Operation

Internal Resolution: 24-bit

Input Range: ± 5.5 mV/V (Avail. to ± 200 mV/V)

Conversion Rate: 60 per second

Error: 0.01%, ± 1 count

Pushbuttons: Tare, Shunt

Precision Shunt: 60 Ω

Indicator: status LED

Outputs

Analog: 16-bit, scalable, ± 10 V

Serial Data: multi-drop RS232, RS485

Switches: dual solid state relays

Power

5 VDC, 250 mA

(included adapter) 110/240VAC, 60/50 Hz

Mechanical

Unit Size: 5.5" X 2.75" X 1.2"

Unit Weight: 8.3 oz. (235 g)

Board Size: 3" X 1.5" X 0.9"

Board Weight: 0.9 oz. (26 g)

APPENDIX B – WEIGHTSENSE™ CABLES AND CONNECTORS

The following is the pinout of the connectors on the WeightSense™. The pins that are not listed below are reserved and should not be connected to external equipment.

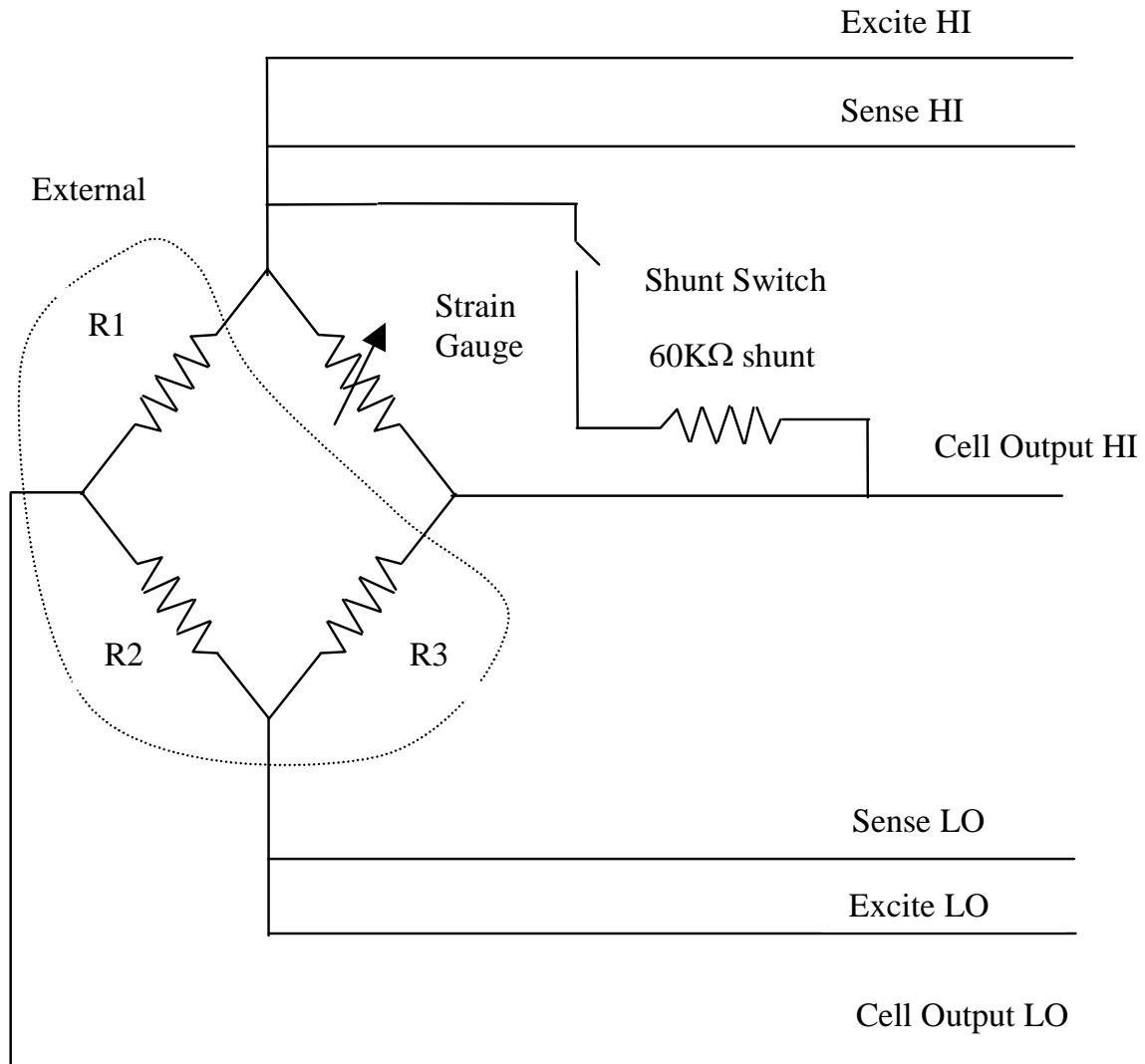
Serial – DB9(F)	
Pin #	Signal Name
2	TXD
3	RXD
5	GND
Pins 6-15	Reserved

Serial Port Pins 2,3 and 5 are used for RS232 communications

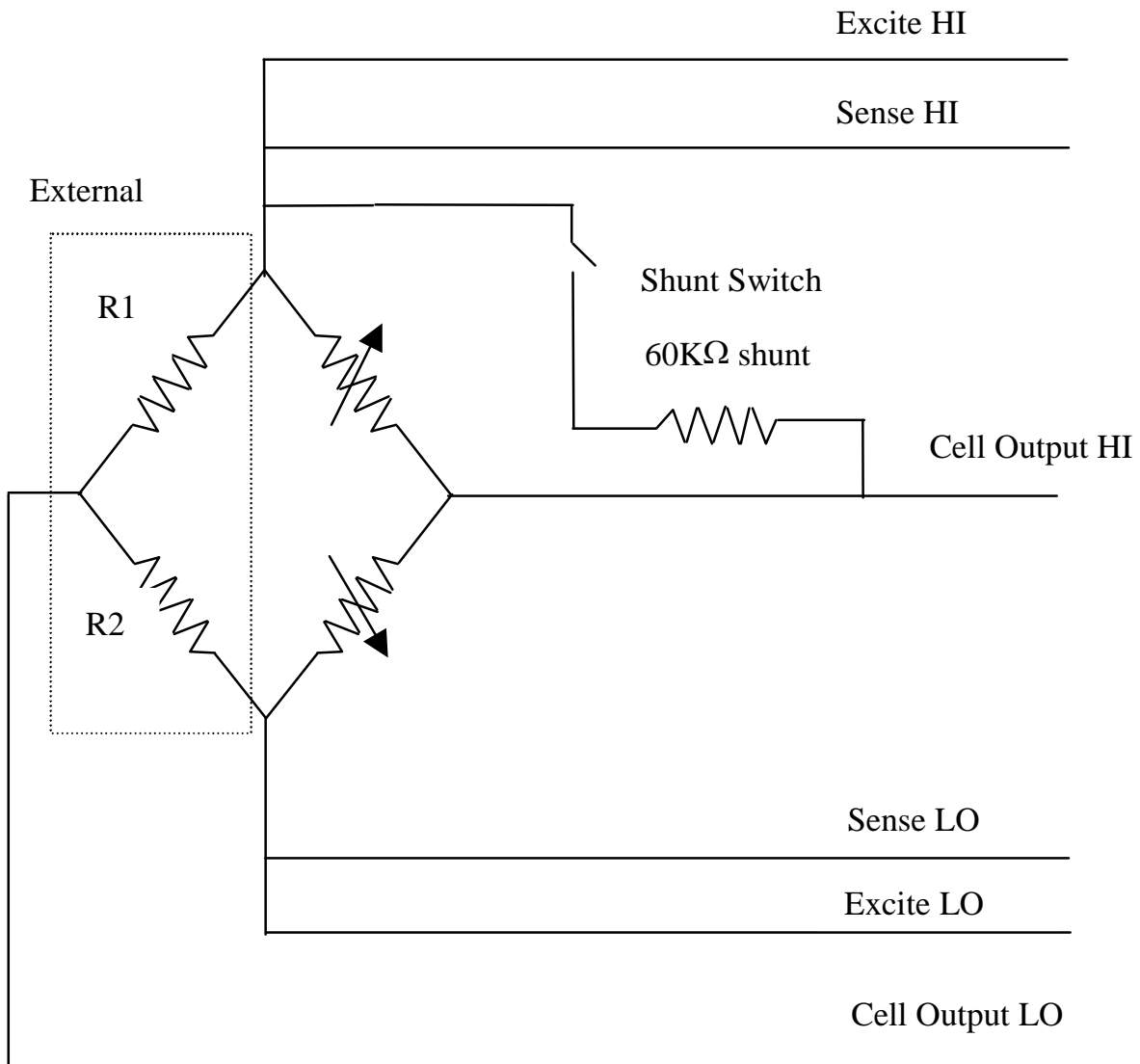
I/O – 8-Pin Mini-Din(F)	
Pin #	Signal Name
1-4	Reserved
5	Analog Output
6	GND
7	Relay/Limit 1A
8	Relay/Limit 1B

Sensor – DB9(M)	
Pin #	Signal Name
1	Excite - HI
2	Sense - HI
3	Channel “A” Cell Output - HI
4	Channel “A” Cell Output - LO
5	Sense – LO
6	Excite – LO
7	* Auto ID
8	Reserved
9	GND

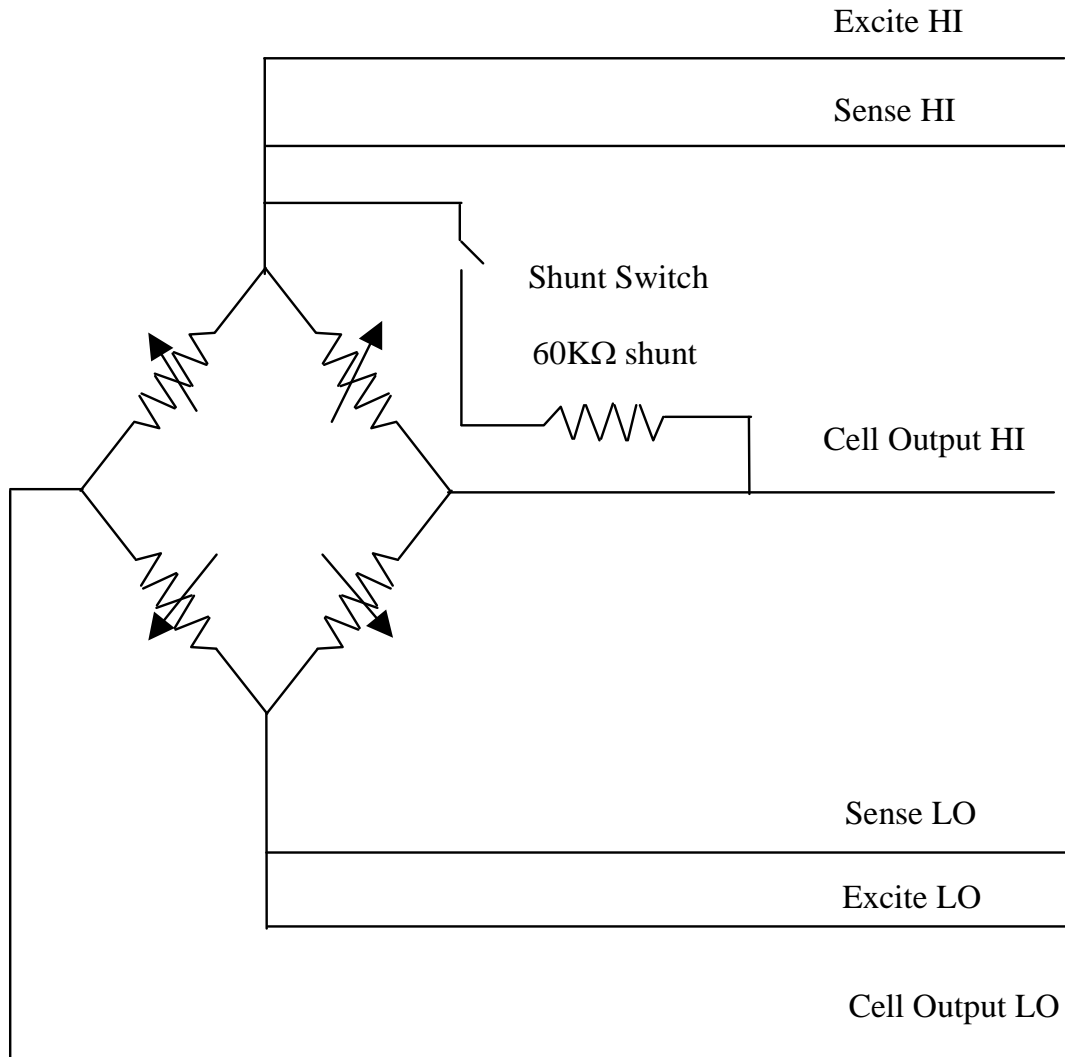
Note: Items preceded by an asterisk are optional.

APPENDIX C – BRIDGE CONNECTION DIAGRAMS**Quarter Bridge Connection Diagram.**

Three external resistors should be added as recommended by the sensor manufacturer to complete the bridge circuit.

**Half Bridge Connection Diagram.**

Two external resistors should be added as recommended by the sensor manufacturer to complete the bridge circuit.

**Full Bridge Connection Diagram.**

Complete circuit provided by the sensor manufacturer. No external resistors are required.