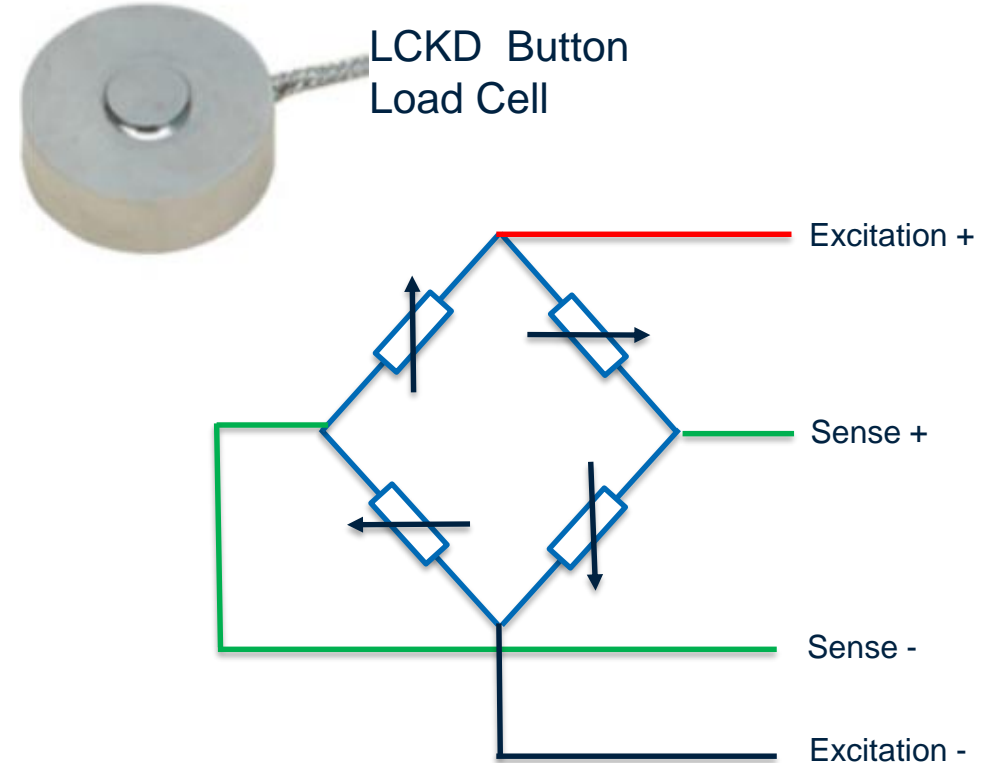


# Load Cell – Wireless Smart Sensor Connectivity Kit

# Load Cell (Bridge) Signals

## What is a Bridge Interface

- A common means to detect small changes in resistance
- Resistance changes due to deformation of material due to applied force
- Common in **Load Cell and Pressure sensor** applications where sensor measurement is the deformation of material.
- The Excitation power causes voltage splitting across resistance elements. If all resistance elements are equal the voltage measured between Sense + and Sense - will be zero.
- Load Cell specific Parameters must be set
- Load Cell reading may be scaled to represent weight, volume ...

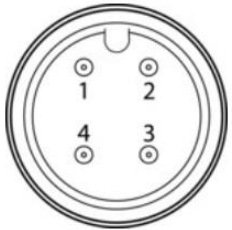


- **Excitation:** Applies a constant voltage or current to resistive bridge circuit
- **Sense:** Will vary depending on the change of the 4 resistive elements due to applied force

# Load Cell – Wireless Smart Sensor Connectivity Kit

Excitation +  
Sense +  
Sense -  
Excitation -

## External Load Cell



Pin	Connection
1	Excitation -
2	Sense +
3	Sense -
4	Excitation +



## ZW-REC Receiver



## SmartEdge Gateway

- **M12-S-M-FM** provides 4 pin Screw Terminal connector
- **SP-010-1** converts Load Cell Bridge input to Smart Sensor digital interface
- **DM12CAB-8-1** → M12 Interface cable
- **XW-ED** connects SmartProbe digital interface and transmits wirelessly to **ZW-REC** receiver
- **ZW-REC** supports up to 128 XW-ED transmitters

# Load Cell – Scaling & Configuration

- External signals (mV) signal conveys information in terms of weight, which represent some other 'unit of measure'
  - Weight to Volume: 1 kg == 1 gal, 10 kg == 25 gal
- Smart Sensor allows linear **scaling** of measurement for **unit** conversion using simple  $y = Mx + B$  formula, where M is the 'gain' and B is an offset.
  - Determine Gain:  $(Actual\_Hi - Actual\_Lo) / (Reading\_Hi - Reading\_Lo) == (25 - 1) / (10 - 1) == 2.66667$
  - Determine Offset: use calculated Gain, with 0 as Actual ==  $-(1 - 2.66667 * 1) == -1.66667$
  - Change the 'units' string to 'gal'

- Must Match specific Load Cell characteristics

**Impedance – automatically detected or may be set based on specific load cell**

**mV/V information determined by specific load cell**

**Full Scale determined by specific load cell**

Sensor Input0	
<b>Sensor</b>	
Name	Input0
Measurement Type	BRIDGE
Advanced Scaling	<input checked="" type="checkbox"/>
Unit	gal
Lock	<input checked="" type="checkbox"/>
<b>Scaling</b> Gain:2.6667, Offset:-1.6667	
Apply Scaling	<input checked="" type="checkbox"/>
Gain	2.6667
Offset	-1.6667
<b>Device Range/Type</b>	
Range	

**Advanced Scaling** option opens the scaling options

Change **unit** to any string (maximum 4 characters)

Ensure **lock** option is set (retains across power reset)

Enter calculated **Gain** and **Offset** values

Parameters	
mV/V	10
Full Scale	1000
Impedance	359
TARE (Target)	0

**TARE – allows cancelling out initial weight**

Tank Volume	49.0 gal	Input1	IN0:0   IN1:0 DIN
-------------	----------	--------	-------------------