Load cells should be electrically connected in such a way that the signal (output) lines, excitation (power supply) and sense (when present) lines are in parallel.

The great part of load cell cables are provided with a braided shield which is used for shielding against electromagnetic interference. This shielding must be connected to the signal conditioning device’s casing. The shield must not be earthed directly, if not authorized, if not authorized. Contents of the present documentation refers to products and technologies described in the document may be modified without prior notice. This content of this document is subject to periodical revision.

The following figures represent the two basic configurations, using four- or six-wire (sense) load cells and 2-30 Ω as signal conditioning device (converter). With 4-wire extension cables the load cell output should be connected to pairs of diagonally opposite wires.

Some times it is necessary to trim the output of each individual load cell to avoid corner load differences, which are caused by:
1) The parallel connection. Each load cell will be loaded with the resistance of the other load cells. As a result, the individual load cell output tolerances will be increased by the individual output resistance tolerances.
2) Unequal load distribution.

All load cells should be placed at the same horizontal level. Check for mechanical unequal load conditions before trimming the load cells.

There are two methods of trimming with excitation. The first method is to adjust the potentiometers by trial and error while moving calibration weights around from corner to corner. All potentiometers should be adjusted to have the maximum sensitivity for each cell while completely turning all of them clockwise.

The second and basic method is "pre-trimming" the potentiometers with the use of a sensitive voltmeter (at least 4-½ digit). The following procedure can be used:
1) Determine the exact mV/V rating of each load cell, which can be found on the load cell’s calibration certificate.
2) Determine the exact excitation voltage supplied by the signal conditioning device/converter (2-30 Ω for example) by measuring this voltage with the voltmeter (for example 10.05 V).
3) Multiply the lowest mV/V-value (step 1) by the excitation voltage (step 2).
4) Divide the trimming-factor found in step 3 by the mV/V-value for the remaining load cells.
5) Measure and adjust the excitation voltage of the three remaining load cells with respective potentiometers. Verify the results and make the final adjustment while moving a load from corner to corner.

Warning: The reduction of sensitivity of one load cell will cause a change in zero of all load cells. Therefore adjust in small steps and always verify the result of each adjustment.

The jumpers may be set in order to establish particular settings as illustrated in the tables on the next page.

The internal jumpers Position 1 and 3 are illustrated on the following figure. On the board the positions are pointed out by the corresponding number at the sides of the jumpers.

**Contents:**
- General Information
- 4-wire / 6-wire load cells
- Electrical connections
- 4-wire load cells trimming - Internal Jumpers

**General Information**

Most industrial load cells are used in multiple load cell weighing systems. Load cells should be electrically connected in such a way that the signal (output) lines, excitation (power supply) and sense (when present) lines are in parallel.

usually the connection is not made at the signal conditioning device, but in a separate housing, as a junction box, located adjacent to the weighing system.

A load cell may have a cable with four or six wires. A six-wire cable, besides having +ve excitation and -ve signal lines also has +ve and -ve sense lines. It is a common misconception that the capability to sense the actual voltage at the load cell is the only difference between 4-wire and 6-wire load cells.

A load cell is compensated to perform within specifications over a certain temperature range (usually +10 - +40 °C). Since cable resistance is a function of temperature, the cable response to temperature changes must be eliminated. The 4-wire cable is part of the temperature compensating system of the load cell. The load cell is calibrated and compensated with a certain amount of cable attached. Never cut a 4-wire load cell cable.

The 6-wire cable is not part of the temperature compensating system of the load cell. The sense lines are connected to the sense terminals of the signal conditioning device, to feed back the actual voltage at the load cell. The signal conditioning device either adjusts its output voltage or adjusts its amplifier or compensator for any resistance change in the cable. The advantage of using this "active" system is the possibility to cut (or extend) the 6-wire load cell cable to any length. A 6-wire load cell will not perform within specifications if the sense lines are not used.

**Electrical Connections**

The load cell case and junction box are grounded by mechanical attachment to the structure to which they are mounted. Usually this structure is grounded. The braided shield enclosing the load cell lead is grounded at the signal conditioning device/converter (2-30 Ω for example), which is grounded through the power cords/existing ground. In order to avoid interference, load cell cables and extension cables should be kept apart. The recommended minimum distance is at least one meter. Power supply cables should be crossed at right angles.

The figures below shows a diagram of three excitation trimmed load cells. A temperature-independent variable resistor or potentiometer of typically 20 Ω is inserted in the excitation load of each load cell.