**Load Cell signals:**

**50 Kg capacity load cell will monitor maximum load 300 N ( may be more ), or max 30.6Kg.f**

**It is 4 wire load cell will run on “Arduino uno” through “HX711 shield “ .**

**Needed sketch details write code clarifying pins connections on Arduino uno :**

1. Interfacing mentioned load cell with 2mv/V output with Arduino through HX711 taking readings with highest possible rate “ex: every 1 millisecond” >> displaying reading on LCD screen in N ,or KG.f with 0.1N resolution at least ( .001 is recommended )
2. **With updated fast reading digital output signal according to value of reading as follows :**
3. Reading increased from zero to just 0.1N (adjustable value under protected engineering level) >> activates **digital output1** (touching signal).
4. Exceeding limit of load cell designed capacity (330 N) (adjustable value under protected engineering level) >>> activates (overload) **digital output2** and alarm message on screen “overload “.
5. Peak value of successive continuous readings >> will activate( peak value ) **digital output3** and message of hardness =” the reading of local peak ,or maximum load value ;**as example :** 65.1 N detected from successive readings 0,1,2,…………..63.5,64.6,65.1,64.4,30,20,11,0 ” >>>>store this peak value in memory as sample reading of hardness >>> display sample reading on LCD screen “hardness = 65.1 N “ . must take care of noise ,sensor jitters, hysteresis .
6. **one Digital signals will be given {Digital input “end of test” from external board }:**
7. if you count one peak only Single sample mode will be displayed on screen and just having peak value it is ready on screen and ready to be printed with print button from keypad.
8. If you read N of samples>. Automatic batch mode will be displayed on screen and will ask user about batch ID includes 12 digit Batch Number entry? And internal counter will count till reaching end of batch at N samples storing all samples values on memory preparing it for printing and statistics.
9. Printing samples readings ,or peak values on normal printer ( clarify printer type and connection please ) (thermal printer is a side option in engineering level settings ) including :
10. its readings basic statistics { average ,min, maximum, standard deviation }
11. Enter and Print Date and Time to the report. (real time and date).
12. Space to put manufacturer data ,and other to customer data.
13. Enter a 12 digit Batch Number label appears on display and in printed report.
14. Calibration report at basic three points 5, 10, and 15 Kg.F. for load cell raw readings ,and another ten points for any arbitrary readings point in piece-wise linear way.
15. Print-out of force increase curve vs time for samples.
16. Display: LCD Display for No. of samples, and hardness, or peak value results.
17. Keyboard: Numerical and function keys.
18. Number of tests prior to statistic: Up to 250.
19. Calibration menu for the hardness test station at three points : 5, 10, and 15 Kg.f to adjust load cell readings and arbitrary ten points .
20. LCD display and optical keypad board Interface.