

# Design & Construction of Measuring Instrument for Cotton Fiber Finness

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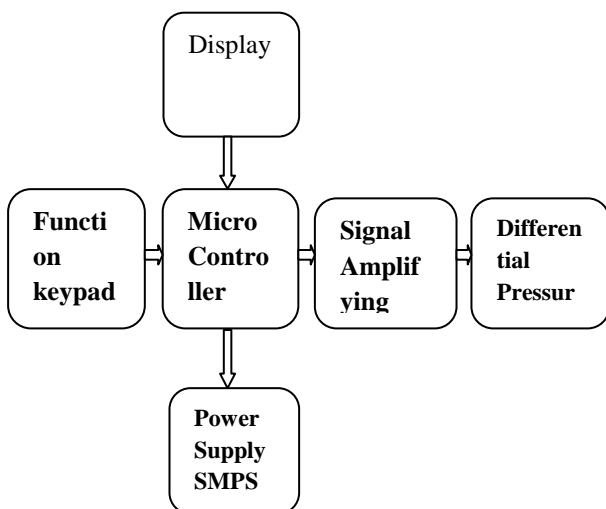
**Abstract:** A known weight of cotton sample is inserted in a known volume of chamber in a compressed manner and a known air pressure is passed through the compressed cotton. The difference in air pressure is measured with the help of differential pressure transducer and it is converted to the micronaire value.

**Keywords:** Design & Construction, Measuring Instrument, Cotton Fiber Finness, DIGIMIC XT.

## INTRODUCTION

DIGIMIC XT is a digital table, top hand instrument which is used to measure the micron air (fineness) value of cotton fiber. This instrument works under the “air-flow principle”. It comprises an inbuilt compressed air system. A balance is required for measuring the sample before it is placed in the cotton chamber. It is based on the air flow resistance of cotton fibers. It fibers of equal weight and density are confined in equal spaces, samples of fine fibers therefore has a greater surface area and thus a greater resistance to the airflow. In DIGIMIC XT, ADUC848 $\mu$ c is used. The pressure sensor gives the distinct voltage output for distinct pressures with respect to the samples. Then the signal is conditioned and given to the controller. Finally, the conditioned signal o/p is processed by the controller and the results are shown through LCD. DIGIMIC XT provides a wide memory space for storing the results of the samples. It can store up to 1000 results. The results can be retrieved from the memory at any time. In built ejection cylinder is used to eject the cotton fiber from the cotton chamber. In built battery is provided in DIGIMIC XT, it helps to operate the machine without power supply for about 6 to 8 hours. It is a handy model. A handle is provided to lift the machine so it is easy to carry from one testing place to another.

## BLOCK DIAGRAM



## DESCRIPTION

### PRESSURE TRANSDUCER:

A pressure sensor measures pressure, typically of gases or liquids. Pressure is an expression of the force required to stop a fluid from expanding, and is usually stated in terms of force per unit area. A pressure sensor usually acts as a transducer; it generates a signal as a function of the pressure imposed.

### MICROCONTROLLER (ADUC848):

The ADuC845 includes two (primary and auxiliary) 24-bit  $\Sigma$ -ADCs with internal buffering and PGA on the primary ADC. The ADuC847 includes the same primary ADC as the ADuC845 (auxiliary ADC removed). The ADuC848 is a 16-bit ADC version of the ADuC847.

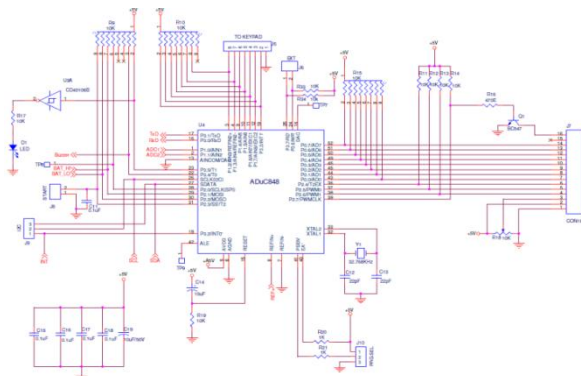
### DISPLAY (7SEGMENT):

A Seven-Segment Display (SSD), or seven-segment indicator, is a form of electronic display device for displaying decimal numerals that is an alternative to the more complex dot matrix displays. Seven-segment displays are widely used in digital clocks, electronic meters, basic calculators, and other electronic devices that display numerical information.

## CONCLUSION

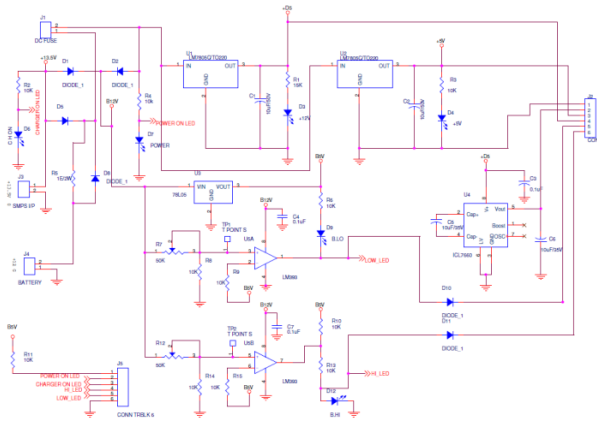
From the above details we can understand the importance and implementation of the software which we used. It provides us to know the interfacing of  $\mu$ c with the system.

### CIRCUIT DIAGRAM: CONTROLLER BOARD:



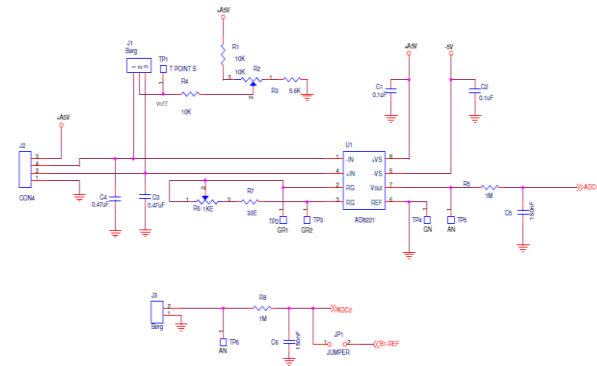
**POWER SUPPLY:**

**REFERENCES**



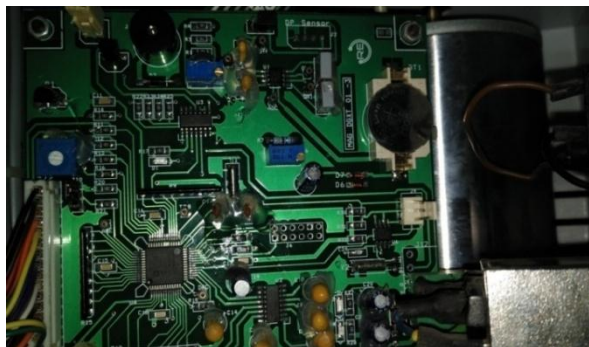
- [1] R. Nicole, "Title of paper with only first word capitalized," J. Name Stand. Abbrev., in press.
- [2] J. Clerk Maxwell, A Treatise on Electricity and Magnetism, 3rd ed., vol. 2. Oxford: Clarendon, 1892, pp.68-73.
- [3] Abbott, A.M., G.J. Higgerson, S.R. Lucas, and G.R.S. Naylor. 2011b. An upgraded Cottonscan™ instrument for measuring the average fiber linear density (fineness) of cotton lint samples. Text. Res. J. 81(7), 683-689.
- [4] Gordon, S.G., R.L. Long, S.R. Lucas, and N.L. Phair-Sorensen. 2008. Using Siromatto distinguish fiber maturity related issues in the mill. Proc. Beltwide Cotton Conferences, National Cotton Council, Nashville, TN, 1459-1466.
- [5] Hequet, E.F., B. Wyatt, N. Abidi and D.P. Thibodeaux. 2006. Creation of a set of reference material for cotton fiber maturity measurements. Text. Res. J. 76(7): 576

**CONVERTER CIRCUIT +5V TO -5V:**



**HARDWARE IMPLEMENTATION:**

**HARDWARE RESULT:**



**POWER SUPPLY UNIT:**

