

DESIGN AND IMPLEMENTATION OF REAL TIME ELECTRICAL PARAMETERS DATA LOGGER FOR 3 PHASE SYSTEM

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Abstract— the monitoring system which displays real time electrical parameters and data logger gives a very important advantage of day to day monitoring of the power consumptions which was not possible with the conventional systems. The project serves the motto of reading the electrical parameters and displaying them with the seven segment display boards. The manipulations of reading the parameters are carried out by the on board controller unit

Keywords— PIC microcontroller, seven segment display, Electrical parameters.

1. INTRODUCTION

Monitoring is important parameter, when there is a requirement to be aware about the electricity supply in the power system, detecting voltage fluctuations in the signals, and to calculate electrical energy consumption. In Electrical network there is a need to develop monitoring and measurement system of electrical parameters [1].The proposed system which monitors values in real time and record the data. To know about the requirements of the system, a survey was conducted on the 3 phase electricity. The Electrical parameters Voltage, Current, Power, Power factor are logged using a PIC Microcontroller based system. The results of measurements are stored in the monthly basis in EEPROM and Real time electrical parameters will be displayed on a seven segment display [2].

2. BLOCK DIAGRAM

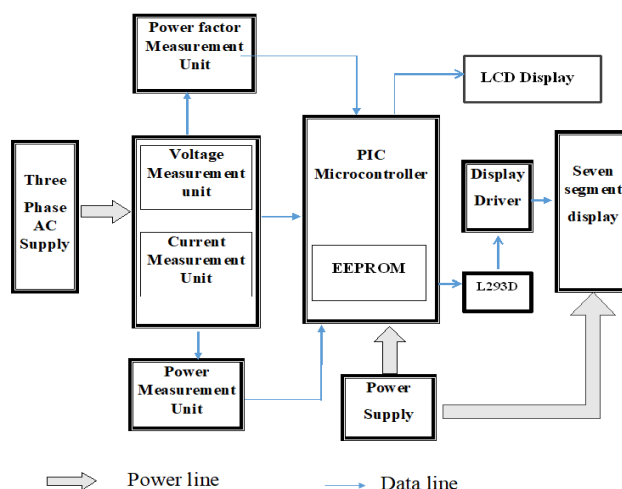


Fig 1

Block diagram of the Real time electrical parameter measurement and data logger system.

In order to implement a three phase electrical parameter measurement and data logger system, there will be various processing sections as described in the block diagram mentioned above.

In this proposed system 3 phase source connected to voltage divider to measure voltage and three analog signals form voltage divider are provided to PIC microcontroller.

In current sensing unit three wires from 3 phase source connected mains supply are passed through holes of the current sensor WCS1500 to measure passing current. The Hall Effect based sensor produces a proportional voltage signal due to magnetic field which is sensed by PIC microcontroller.

This analog values which are sampled by the ADC unit of PIC18F4550. The controller processes these analog inputs and converts them into digital values. Converted data is time stamped using time values from RTC for its manipulation. After manipulations power, power factor are calculated and the electrical energy is measured in terms of KWh by using the relationship between the voltage, current and power. All calculated electrical parameters are displayed on seven segment display.

3. EXPERIMENTATION

Designed data logger and measurement system has been tested for various varieties of load of different capacities and various types of loads. E.g. Resistive load.

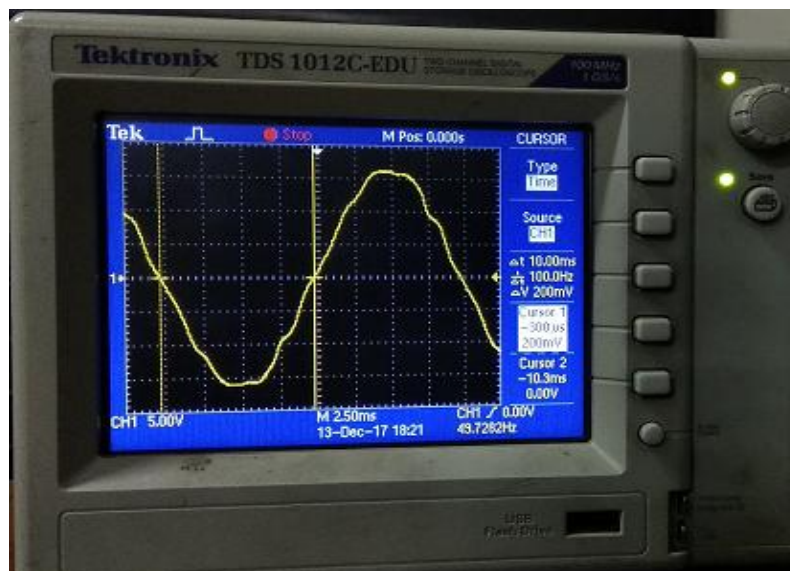


Figure2. Practical Output AC waveform of voltage

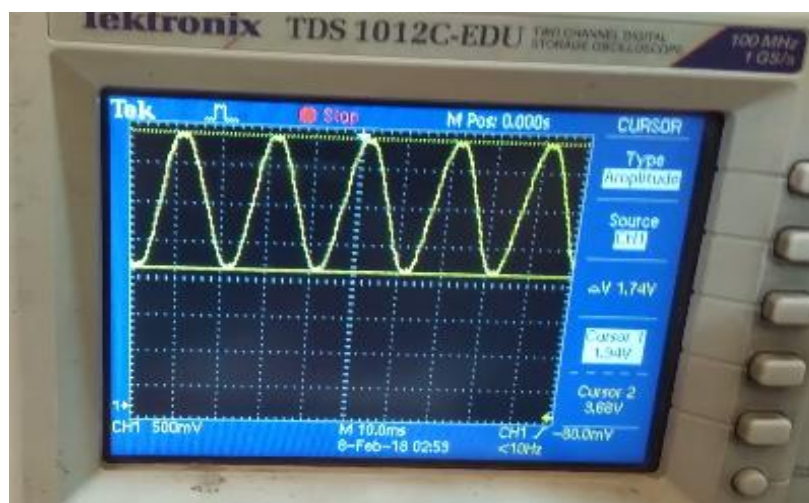


Figure3. Output AC waveform of current



Figure4. Hardware model

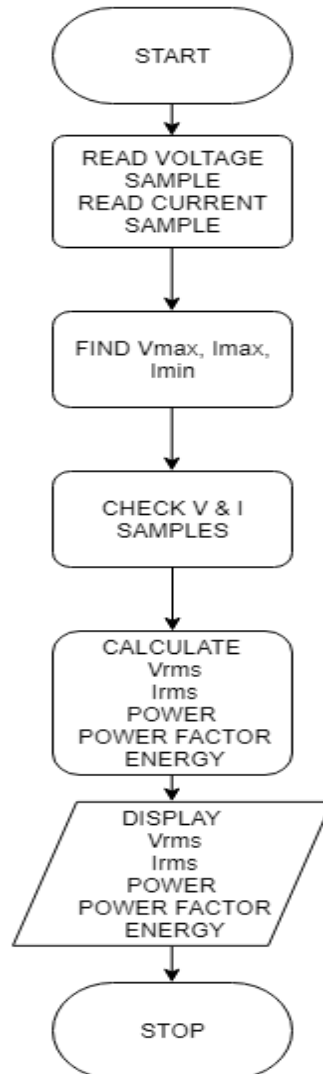
Voltage Testing Results:

Voltage on DMM (V)	Voltage Clamp On Meter (V)	Voltage displayed by system(V)
73.8	73.7	73
150.4	149.7	150
200	200.4	200
230	230.4	230
316	315.6	315
400	400.3	399

Current Testing Results:

Analog Ammeter (A)	Clamp On Meter (A)	Current displayed by system(A)
5.4A	5.2A	5.2A
6.9A	7.0A	6.9A
9.1A	8.4A	9.1A
11.6A	10.5	11.0A
14A	12.9	13.5A
16.2A	15.0	16A
19.1A	17.5	19A

4. FLOW-CHART



5. CONCLUSION

In this paper we describe the design and development of real time data logger for measurement of energy, voltage, current, power and power factor for three phase system. Comparing existing devices this system has low cost, easy to operate and also gives online and offline analysis.

6. REFERENCES

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