Smart Glasses Multimeter

Suraj Khamkar[1], Ashish Bhosale[2], Vaibhav Damame[3]

[1,2,3]Department of Electronics and Telecommunication, AMGOI, Shivaji University, Kolhapur(MH), India

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Abstract - *Usually the person faces problems while testing/troubleshooting electrical works/PCB while placing samples on 2 points and looking at the exact time of the multimeter. This also takes a lot of time and leads to incorrect/improper measurements. To solve this problem system integrating virtual voltage and current display through the user's glasses while the system is being troubleshooted/tested. This system is based on ARM 7 LPC2148 for processing and displaying output. The glass frame is made using a miniature frame that has been smartly constructed. The frame is designed to fit a OLED type display together with the circuitry and display lens used for the glass frame's desired reflection. The system is manufactured to fit easily on the ears of a person and allow the person to view the circuitry together with the measured voltage.*

*Key Words***: Multimeter, Troubleshoot, Virtual, OLED etc.**

1. INTRODUCTION

In the past few years, the measuring of the electrical parameters like voltage and current has been difficult. There are lots of problems like accuracy and everything while measuring the voltage and other parameters on the multimeter. While measuring it, at the same time the observer looks at the samples, he has to look at the multimeter to see what the readings are. During such measurements the probes can be disturbed and the observer will take incorrect reading.

Those with the swinging needle are analog multimeters. There are also some serious disadvantages to analog multimeters. Accuracy is the most severe analog multimeter disadvantage. Three causes of error exist.

First, the device's mechanics make it inaccurate-the instructions that come with an analog multimeter suggest you set the scale to the right side of the scale where the inaccuracy is only 1 or 2 percent. As you move left across the scale, the inaccuracy increases. Second, making mistakes when counting the marked graduations is easy, especially if your observation angle is off. You also must interpolate the last digit when the needle falls between two graduations. Third, inaccuracies can be introduced by scales. The most obvious of these is being on the wrong scale. Moreover, you have to do a bit of arithmetic for most measurements, and that's often a mistake waiting to happen.

2. OBJECTIVE

1. To measure electrical parameters accurately.
2. To increase mobility of multimeter.
3. To enhance observer convenience while measuring electrical parameters.

3. PROPOSED SYSTEM

The system consists of a measuring voltage circuit that is integrated into the glass to get the voltage and current inputs to the display of the ARM 7 LPC2148. In this system problem facing with conventional multimeter is gets resolved. Voltage and current sensors are interfaced with ARM and measured voltage or current will be shown on display. The reading shown on OLED display is gets reflected through lens and displaying the output right next to eye glasses. This system help to reduce human efforts and gives correct measurement.

This project's comparatively cost is not too much as many number of sets required. It also has light weight so that observers can wear smart glasses without any problem for a long period of time. It has built all the circuitry into one box of wood and placed right behind that smart glass. There are therefore fewer human danger possibilities. It uses only 9V battery so that there are no problems with it as well. Testing probes are right in front of the observer, i.e. smart glasses, so there is no problem with test probes during measurement as well.

4. BLOCK DIAGRAM

4.1 Description:-

Fig. 1 shows the basic smart glass block diagram for measuring voltage, current. The voltage sensor, current sensor is interface with the ARM 7 processor in this project. The OLED display is interfaced with ARM and ARM gives the processed data to OLED display.

Mirror used in this system is simple mirror we use in our day to day life. Convex lens is used for reflection of the OLED data through it. The readings/data getting from convex lens is reflected through reflector on eye glasses.

And finally we'll test the desired parameters and measure them.
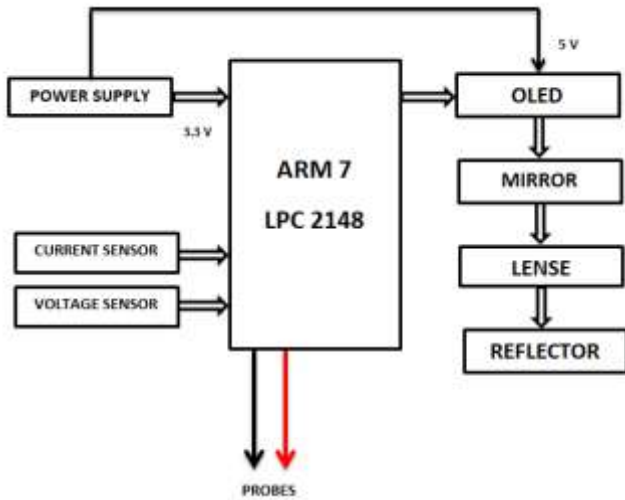

4.2 Block Diagram

Fig. 1 :- Block Diagram
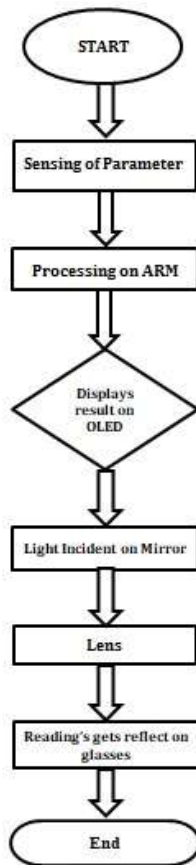
5. FLOW CHART

5.1 Flow Chart Diagram

Fig. 2 :- Flow Chart

5.2 Description

1. Start
2. Sensing of electric parameters using probes
3. Processing on given data in ARM7 LPC2148
4. Displays the final reading on OLED display
5. Incident light on Convex Mirror
6. Transfer the readings in the form of light through lens
7. Reading gets reflected in front of eye glasses

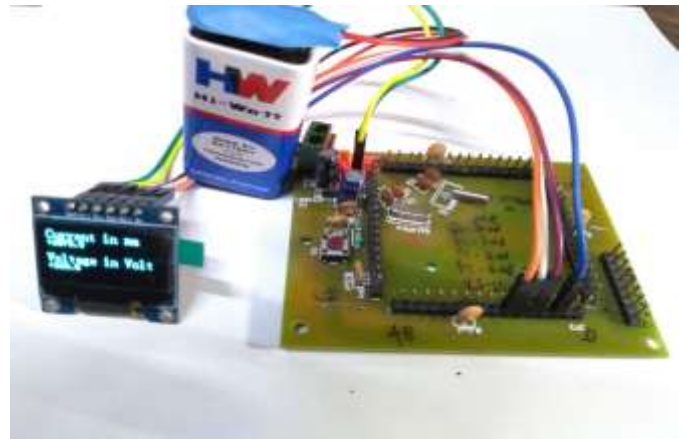## 6. RESULT AND DISCUSSION

6.1 Project Image

Fig. 3 :- Project Phase I

Fig. 4 :- Project Phase II

6.2 Output Table

Parameter	Input	Measured
Voltage	260 V	259 V
	120 V	120 V
	70 V	69 V
Current	0.27 A	0.3 A
	0.48 A	0.5 A
	0.81 A	0.8 A

Table No. 1

In the above table shown parameters is measured on proposed system. In Input column the current and voltage is measured using conventional multimeter & in Measured column the readings are taken using proposed system made. This table no. 1 shows accuracy of system. so that our project will occur in order to overcome accuracy and handling problem.

6.3 Advantages

1. Light Weight
   This system has less weight that conventional multimeter which is easy to handle.

1. Mobility
   Mobility of this system is enhanced. You can move it from here and there easily.

2. Convenient
   The system is more convenient for the observer than conventional multimeter

7. FUTURE SCOPE

In the future we can increase the number of parameters like frequency, resistance, hFE etc.
Range of the measuring parameters should be increase.
Noise which is introducing in OLED should be reduced

8. CONCLUSION

In this system, accurately address the measurement of electrical parameters. System has a lot of knowledge of different things while doing this project. The main thing in this project is related to the 'lenses' used. Likewise, system gives knowledge about software like Proteus, Keil uvision, and many things. By making this project, many changes observed during voltage or current measurement. Because it is very difficult but interesting to measure the electrical parameters using samples and displays their values on your spects or glasses.

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