

Oscilloscope Using Android

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Abstract—In past decades oscilloscope is called as oscilloscope, and also known as CRO or DSO is a type of electronic test instrument. Handy oscilloscope is most important application in this mobile generation. Where no one is sitting at a place to finish their work. We can easily move from one place to another place. [1] We are thinking about to carrying a App that will be easily carried from one place to another place and work efficiently another as an oscilloscope. To implement an oscilloscope instead of carrying another expensive CRO which is good idea Android based oscilloscope. [2] This handy oscilloscope require small circuit to manage input and provide to android Blue tooth sensor. The Wireless Oscilloscope android application helps to observe the waveform of the closed Circuit. This application is supported by all Smart phone's and tablet computers that work on Android Operating system. Hence it is easy portable and easy installation. [4]

Keyword—Blue tooth unit, PIC 18F458, Android phone.

INTRODUCTION

Now days there are large size high cost oscilloscope are use in which we see different waveforms and measure the frequency, time etc., in a lab only, which consume a lot of time and money, in order to provide best solution on this we can implement this project using Android...! Portable oscilloscope currently in the market are very expensive, less power efficient and have small low display. [1] This paper present the design and implementation of a low cost, light-weight, consume less power, dual channel oscilloscope, consisting of a hardware device and a software application. The device is interface with a Blue tooth module to provide connectivity to device with Blue tooth. An android OS is selected because there are decent no of Android device user and most of these device satisfy the requirement of the oscilloscope software application. The hardware device include the input signal and embedded Blue tooth module for transmitting the signal to the Android device for displaying the waveform. The android device receive the data transmitted from the hardware device and plot the waveform according to the display by user. [2]

Then this waveform is set by the user which calculate the sampling rate and value of sample. The application provide the single mode operation is a channel 1 and channel 2. Android is a software device that a set of system program or a set of

Application program to complete system. The oscilloscope which are available in CRO DSO in market is too expensive not handy, user friendly, not portable. So if we oscilloscope can be handy with the help of android operating system, whenever we want to see the waveform it is in our android phone We are developing the real time application the android oscilloscope. This is a cheaper, light-weight, less power consumption, dual channel oscilloscope. The device is connected to the Blue tooth unit to provide connectivity to a device with a Blue tooth. We have program this device in eclipse software.

II. LITERATURE SURVEY

In the modern world, cathode-Ray oscilloscope plays a major role in electronic measurement field. CRO is mainly used to measure the voltage across the circuit with change in time. The major disadvantage of CRO are to spend huge amount of money to buy it .To overcome this, CRO functions can be brought as an android application. Android is a Linux operating system design basically for touch screen mobile device such as a smart phone. Advantage of this android application is mainly environmental sustainable application, high mobility, three time lesser than the cost of CRO and wireless the cathode ray oscilloscope is a type of electronic test instrument that allow observation of constantly varying signal voltage, usually as a two-dimensional graph of one or more electrical potential difference using the vertical or y-axis, plotted as function as a time. This allow the measurement of peak-to-peak voltage of a waveform, the frequency of periodic signal, the time between pulse, the time taken for a signal to rise to full amplitude, and relative timing of several related signal.[2]

In this paper, we suggest a design and application of a wireless remote measurement system, which is an adding of a master-slave model Windows-based signal generator, a DSO, and a transmission channel of a Blue tooth and android phone. The new results display that the broadcast rate of the remote measurement system can reach 1.2 K samples per second that can some delay in the whole system operation. However, due to the impedance matching in the waveform renew the overall bandwidth limitation of the measurement system is limited by the physiognomies of the interface circuits. [1] The primary consequences from the test tour slow by a local oscilloscope and our new system agree with each other. In the literature survey we found that Oscilloscope is very important testing instrument in Digital storage Oscilloscopes currently in the market are having following drawbacks: -very expensive,it consume more power, have small low resolve displays. Bulky the transmitter circuit uses PIC18F458 microcontroller for the analog-to-digital change of the input signals. The treated data on the PIC are then conveyed to the phone (for waveform display) via the Bluetooth module. [2]



Fig2.1 general cathode ray oscilloscope

METHODS AND ALGORITHM

In previous system the system is implemented using through Wi-Fi. The main issue with the Wireless security is simplified access to the network compared to the wired network.

Wi-Fi Limitation of Wi-Fi:

- 1) Wi-Fi can be less secure than wired connection, such as a Ethernet to enable Wi-Fi one need to be within the range of the Wi-Fi network.
- 2) Wi-Fi network were open to anyone. Some people made a hobby of driving around looking for open network.
- 3) Connection is very limited but in rural area connection is disconnected.
- 4) Secure Wi-Fi network can be easily attacked by hackers.

In the previous system is made using AVR atmega 32. This is a low power CMOS 8-bit microcontroller based on the RISC architecture. In that technique we get only the sine wave and square wave. In this only one channel is obtain that's why only one waveform we can see. In AVR 8-bit ADC is used. The conversion speed of AVR is less than PIC microcontroller.

Limitation of AVR microcontroller:

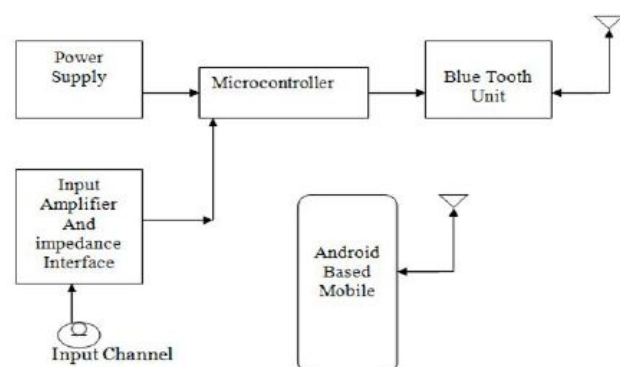
- 1) Limited memory, it is not needed for every application.
- 2) In AVR only 8 bit ADC is use so only limited range given. That is only in 0-256.

We use the PIC18F458 microcontroller in this PIC we see the two channel waveform. This gives the better result than the AVR. In that we compare the two channel by using the

android app. The PIC has 10 bit ADC which work on the RISC architecture. Because of having 10 bit ADC it gives the proper wave shaping signal and gives the better speed than the AVR.

They are very reliable and malfunction of PIC percentage is very less. Power consumption is very less.

SYSTEM OVERVIEW



Block diagram description:

i) Microcontroller:

As in today's world microcontroller is essential to serve as the brain of our system by controlling all others IC's. In our system the microcontroller is use which sample the input data. The microcontroller is a multichannel on chit ADC which is use for sampling. In our system the microcontroller which we have use is a PIC microcontroller (18F458). The pin no 2 is an ADC which convert analog signal into digital signal. [3]

ii) Bluetooth:

Bluetooth Wireless technology is short range communications technology intended to replace the cables connecting portable or fixed device. It transmits data via low Bluetooth technology has the ability to handle both data and voice transmissions at a time. The key features of the Bluetooth technology are robustness, less power, and cheaper.

a) Frequency Spectrum: 2.45 GHz (between 2.402GHz and 2.480 GHz).

b) Interference: A number of household devices, Including baby monitors and mobile also take advantage of the same radio-frequency band as the Bluetooth.

- c) Range: 32 Feet
- d) Data Rate: The version USB Bluetooth adapter can support a data transmission rate of up to 3 Mbps.
- e) Power: Bluetooth technology is designed to consume very less power. The most commonly used Class 2 Bluetooth transmitter uses around 65mW of power.
- f) Cost: A USB Bluetooth adapter is available in the market for \$17. We had several Bluetooth options available to us if we want to use Bluetooth transmission in our device [5]



Fig 4.1 show the Bluetooth module [3]

CONCLUSION

In this way we implement this system with the help of android mobile operating system. So that we can design our objective i.e. oscilloscope on android phone which becomes the mini oscilloscope with the help of this system we can saved the output of different kind of wave shaping signal in the mobile system. For e.g. sine wave, square wave. Triangular wave. [2] This paper conveys the basic idea related to less cost, portable, less complexity Bluetooth embedded oscilloscope. The hardware device includes circuitry to get the input voltage signals and an Bluetooth module for transmitting the input signal information to an Android device for displaying the waveform. [3]

ACKNOWLEDGEMENT

I take this opportunity to express gratitude to my guide, Prof. P.P. Chaudhari Sir, for his constant encouragement, able to guidance and support throughout the course.

I take this opportunity to thank Head of Department, Department of electronics and telecommunication

Engineering, Mr D.P.Patil sir and express my gratitude to wards my parents, friend to complete my work.

I sincerely thanks Dr. R.G. Tated sir, principle, sandip institute of engineering and management, Nashik, for his advice during the course of my work.

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