

# PERFORMANCE VERIFICATION OF DIFFERENT ECG PARAMETERS USING UTLP KIT

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**Abstract**— Health, is the very important feature of a Human being. Heart play a important role in human body. The environmental change threatens the well being human. In our project “Performance verification of different ECG parameters Using Unified Technology Learning Platform (UTLP)”, we mainly discuss regarding the heart related problems and the body temperature. Here we discussing about, Heart rate, the speed of the heart, Blood Pressure the pressure of the blood circulatory system, Body temperature, minimum temperature required to be healthy. The console window is used to give the input to the system. Inputs are blood pressure (BP), body temperature, Pulse rate values. It display the output by comparing the given input and the values specified in the program. The Graphic Liquid Crystal Display (GLCD) in Unified Technology Learning platform (UTLP) is used to display the Electrocardiography (ECG) image. The character liquid crystal display (CLCD) will display character in two lines. The main purpose of the character liquid crystal display (CLCD) to display the condition of different parameters such as its normal or abnormal.

**Keywords**— Character Liquid Crystal Display (CLCD); Eclipse Software; Graphics Character Liquid Crystal Display (GLCD); Unified Technology Learning Platform (UTLP).

## I. INTRODUCTION

In recent decades life style is an important factor of health. Now a day’s people facing so many health issues Because of the improvised automated society. The main aim of our project is to monitor the different parameters of the heart. Heart problems plays a major role in human health condition among the stroke, mental stress depression. Here we also working on ECG to know the reason for heart Problem. By measuring the parameters of ECG we get know the different diseases which are related to heart. The normal ECG parameters of a healthy human beings are , PR interval is 0.2-1.2 seconds, P wave is 80ms, QRS complex is 80-100Sms, ST segment is 80-120ms, T wave is 160ms. There are different types of diseases in heart attack. Here we working only on three diseases, they are

1. Normal Sinus Rhythm (NSR)
2. Atrial Fibrillation (AF)
3. Ventricular Tachycardia (VT)

Sinus rhythm means a normal heart rate, heart rate will fall between 60 and 100bpm. The rate in NSR is generally regular but will vary depending on continuous inputs into the sinus node. The atrial rate varies in range of 300 to 700bpm. ECG findings in AF include the absence of P waves and presence of low amplitude, high frequency atrial fibrillation waves. VT produces a rate of 60-120bpm. It typically occurs in patients with underlying heart disease, VT can be very dangerous, it can lead to sudden cardiac arrest and death

## II. METHODOLOGY

Unified Learning kit (ULK) is based on Texas Instruments application processor and Spartan-6 FPGA. It facilitates ARM 8 processor, is based on the ARM architecture. The use of ARM 8 processor is support the high speed devices. ARM 8 Processors support ARM cortex A8 600MHZ CPU, Xilinx Spartan-6, power VRSGX graphics, LCD, audio in, audio out, seven segment LED, Dual line character LCD, external Bluetooth, onboard RTC, connectivity UART, I2C, USB 2.0 OTG, Ethernet(10/100Mbps) and API supports for debug and ULK control panel.

Ubuntu Personal Computer (PC) is used to run the UTLP Kit. The software adopted here is ECLIPSE, is multi-language software which is developed using DET (development environment tool). This software has an extensible plug-in system. Here the code is written mostly in java we can also write the code using ADA, C, C++, COBOL, PYTHON and HASKELL also. In our project we are writing the code using C language.

ULK Control panel is developed using Ubuntu PC which provide the communication between the Ubuntu PC and the UTLP kit. As shown in the below figure1.



Fig1: PC and Client interface

ULK Status	
ULK Device Status	<b>Connected - Idle</b>
IP	192.168.2.80
Name	ULK1
MAC	0:11:22:33:44:55
ULK Scanning / Naming Operations	
ULK Count	1
List ULK	
ULK Naming	Find ULK
List UnNamed	
ULK1 -> IP 192.168.2.80, MAC 0:11:22:33:44:55	
ULK Connect Operations	
Connect	DisConnect
Load	Run
Continue	
ULK Debug Operations	
Mem R/W	Reg R/W ARM/DSP
Banked Reg R/W ARM/DSP	
Nand Read	
ULK Config Operations	
Flash	Flash Release
Advanced	
Console	
Enter Scanf Data:	Send
<pre> Connected to 192.168.2.80 from 192.168.2.113 Connection Terminated!!! Connected to 192.168.2.80 from 192.168.2.113 </pre>	
Clear	Save Log
Stop	

Fig2: ULK Control Panel

The Character Liquid Crystal Display (CLCD) is used in our project is to show the character and the numerical values. To display the 16 characters in dual line 16x2 LCD is used.so each character in the line displayed in 5x7 pixels matrix. The 16x2 character LCD is interfaced with I2C. The Graphic liquid crystal display (GLCD) is used to display the ECG image in GLCD. In which each pixel has a 24 bit value written from this location until the last location defined by 320x240 resolution. The 24 bit color information has 8 bits for each of Red, Green and Blue(R G&B). The touch screen analog signal from 3.5inch LCD will be interfaced with touch screen controller through 54pin LCD connector.

### III. Block diagram of performance verification of the ECG parameters

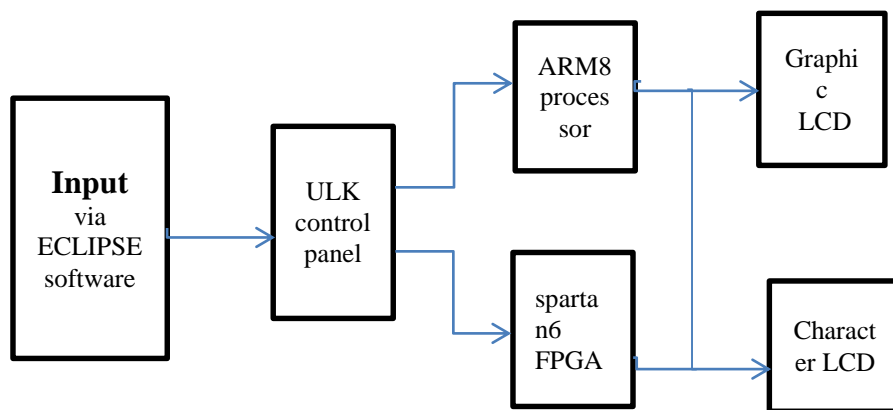


Fig 3: Block diagram of performance verification of the ECG parameters

#### ➤ Input

In the Eclipse software we written the code for the parameters of heart like, blood pressure, pulse rate and temperature. After debugging the code, the program is dumped to the kit via control panel. Then the data of the parameters has to be given in the console window.

#### ➤ Output

The Health Monitoring System is displayed in the CLCD and also the final result for the given different parameters is shown in CLCD. Ex: The BP is normal or abnormal such has for pulse rate and temperature.

- The GLCD is used to display the waveform of normal ECG, NSR, VT, and Atrial Fibrillation.
- Console window display the condition of the different parameters of the heart on basis of the given input values.

### IV. RESULTS AND DISCUSSIONS

The console window used to give the input of different parameters via keyboard. The given input data is compared with program and display the condition of the heart. Ex: BP is normal or abnormal, such as for pulse rate and body temperature. The final result of the health monitoring system using UTLP kit is shown in the CLCD and console window. The console window used compare the given parameters data with data given in program. The condition of the heart is displayed in the CLCD and console window.



Fig4. ECG waveforms



Fig5. Output in CLCD



Fig6. Output in UTLP Kit

## V. CONCLUSIONS

“Health Monitoring System Using UTLP kit”, provides the health measurements of a human being. The health parameters like, heart rate, Blood pressure and Temperature measured through the program given via eclipse to the ULK panel. In the GLCD screen, we have given four types of ECG patterns and by touching the GLCD the information of the every ECG patterns will be displayed in the CLCD screen. Here this patterns represents the particular disease of a human.

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