Scientech

IoT enabled system for Biomedical applications

Scientech 6205BA

Sensors

Temperature sensor

Heart rate & Oximeter Sensor

Galvanic Skin Response GSR sensor

ECG sensor

A healthy life is one of the most promising blessings that an individual can ever experience. The future of healthcare is slowly taking its shape in front of us with every passing day.

The Internet of things (IoT) is redefining healthcare as we know it. IoT has given us a fresh approach as new tool that accommodates an integrated healthcare network, and subsequently provides easy monitoring.

Scientech 6205BA IoT enabled system for Biomedical applications provides a platform for users to learn and interface various sensors used in healthcare. Users will get to know how to analyze the sensors data at remote places using IoT. Scientech provides a chance to technology students to explore the devices to make them communicate with each other (wirelessly) and analyze the real time sensor data at some remote terminal.

Scientech 6205BA provides students an experience to understand IoT technology works and how it is helping healthcare sector to monitor and treat the patient's condition without really contacting them physically.

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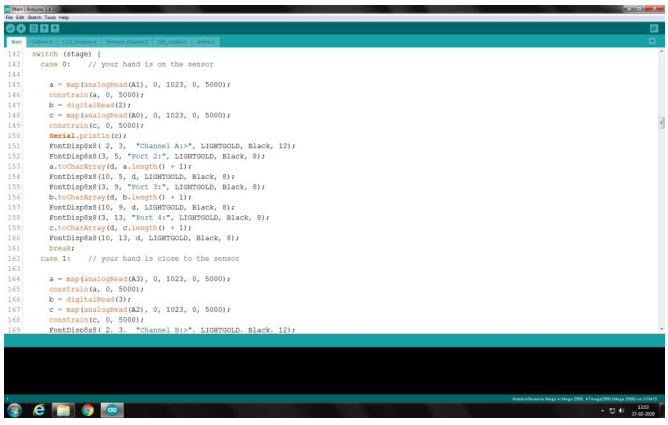
Features

- A friendly platform for experimenters to learn, explore and develop IoT skills.
- Arduino software compatible hardware.
- Heart rate, GSR, temperature and ECG sensors.
- Battery operated smart sensor gateway for sensor connectivity.
- USB and zigbee connectivity for computer interface.
- Wi-Fi connectivity for cloud interface.
- Sensor gateway with color LCD.
- Buzzer and input/output switch for testing.
- Wi-Fi connectivity and android app for field testing.
- Software to view sensor's real time graph analysis.
- 10 din sockets for sensors and actuators interface.
- On board charging and protection circuit for battery.
- Signal test points and switch faults.
- Inbuilt voltmeter and ammeter.
- User friendly explanatory system.

Software window



Sensor interfacing code

Scope of Learning

- Understanding of arduino IDE software.

Interfacing of :

- Wi-Fi and zigbee module.
- ESP8266 for online cloud interfacing.
- LED blink program.
- ACD and UART programs.
- Color LCD.

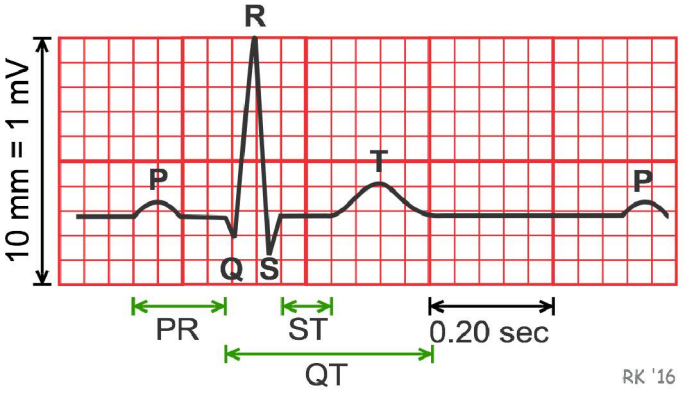
Design and develop:

- Smart biomedical application programs.
- Remote health monitoring system.
- Program to configure events and alarms.
- Interfacing of wi-fi and zigbee modules.
- Interfacing of ESP8266 for online cloud interfacing.
- Python program to collect data and upload on cloud.

Testing and understanding of:

- Heart rate and pulse oximeter sensor.
- Temperature sensor.
- ECG sensor.
- GSR sensor.

ECG waveform



Note: Biomedical sensor platform has been designed in order to help researchers, developers and artists to measure biometric sensor data for experimentation and test purposes. However, as the platform does not have medical certifications it cannot be used to monitor critical patients who need accurate medical monitoring or those whose conditions must be accurately measured for an ulterior professional diagnosis.

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Technical Specifications

Microcontroller	: ATMega2560
Sensors and actuator connector	: 10nos.
Digital input/output pins	: 34 nos.
Analog input pins	: 16 nos.
UART	: 2 nos.
I2C	: 1 no.
Switch faults	: 30 nos.
Test points	: 30 nos.
Power Supplies	: 5V and 3.3V
Variable potentiometer	: 1 no. (10K)
Switches	: 3 nos.
Digital voltmeter and ammeter	: 0 - 25V/10A
Buzzer and LED	: 1 no. each
Color LCD	: 1.77 inch
Battery	: 3.7V/4400mAh
USB	: 2.0
Wi-Fi module	: 1 no. (2.4GHz)
Zigbee transceiver	: 2 nos. (2.4GHz/63mW)
Flash memory	: 256 KB of which 8 Kb For bootloader
SRAM	: 8 KB
EEPROM	: 4 KB
Clock speed	: 16 MHz
Node operating voltage	: 5V DC
Temperature sensor	: 0 -100^{0}C
GSR sensor	: Analog voltage
Heartbeat (Pulse-oxi meter)	: Digital voltage
ECG sensor	: Analog voltage
Power Supply	: USB powered
Weight	: 2.5Kg (approximately)
Operating conditions	: 0-40^{0}C, 85% RH

Package contains	Quantity (nos.)
• Scientech smart sensor gateway	1
• Temperature sensor (SS186)	1
• GSR sensor (SS53)	1
• Heart rate (Pulse-oximeter) (SS39)	1
• ECG sensor (SS43)	1
• A to B USB cable	1
• DC adapter 5V/3A	1
• Patch cord	5
• 2.4 GHz antenna	1
• USB zigbee receiver	1

Complete package

Subject to change Version 1.0

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