

REQUIREMENT BASED OXYGEN FEEDING CONTROLLER

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Abstract - This project deals with the measurement of heart rate and oxygen saturation. The developed real-time pulse monitoring system has a pair of light-emitting diodes (LEDs), one LED has a wavelength in red and other is in infrared region. The light is detected by a photodiode. The LEDs and photodiode are packed in Velcro strip such that it faces the patient's fingertip. The pulse data is calculated by Atmega16 microcontroller unit. Pulse data is read every second and stored in microcontroller. The Measured Parameters were displayed on the LCD Module. The low-cost, portable and wearable pulse oximeter is available in market. A pulse oximeter is a non-invasive device capable of monitoring the blood's oxygen saturation. It has been widely used in the medical fitness and clinical care worlds. The use of pulse oximeter has been continuously increasing due to its utilization at several measurement sites such as the chest, wrists, forehead, and feet. This study is aimed to design Requirement based oxygen feeding controller, which can be used in real time monitoring of human health. Thus, as many time most of oxygen is wasted on a patients whose blood oxygen level is sufficient. To overcome this drawback of this present system this module supplies oxygen only when blood oxygen level is low.

Key Words: Power Supply, Oximeter, Spo2, AVR, Pneumatic Actuator.

1. INTRODUCTION

Oxygen is essential part in ICU and hospitals, many time most of oxygen is waste on a patients whose blood oxygen level is sufficient. To stop this present system which supplies oxygen only when blood oxygen level is low. The very important parameters for health monitoring are heart rate and oxygen saturation. A Pulse Oximeter is a medical device that indirectly monitors the oxygen saturation of a patient's blood as opposed to measuring oxygen saturation directly through a blood sample and changes in blood volume in the skin, producing a Photoplethysmograph. Use of light to measure blood oxygen saturation and heart rate is called Pulse Oximeter. It relies on measurement of physiological signal called Photoplethysmograph (PPG), which is an optical measurement of the change in blood volume in the arteries. Pulse Oximeter requires PPG signal by radiating two wavelengths of light through the tissues and compares the light absorption characteristics of blood at different wavelengths. The comparison leads to measurement of the

oxygenation of blood and is reported as blood oxygen saturation.

1.1 Objectives

- 1) To measure blood oxygen and control oxygen flow using pneumatic actuator.
- 2) To transmit Data through Cloud to authorized person.
- 3) To develop the App to control the flow of oxygen.

1.2 Aim

The project seeks to eliminate the use of excess of oxygen given to patient by measuring blood oxygen level and actuating oxygen supply whenever it is needed in controlled amount.

2. BLOCK DIAGRAM

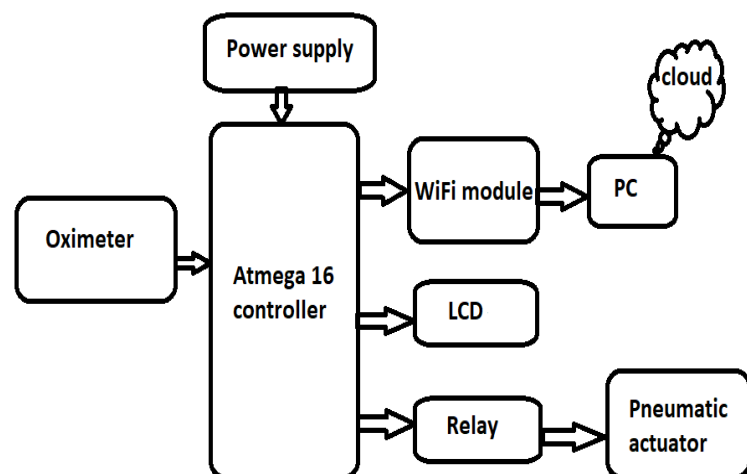


Fig -1: Block Diagram

The Pulse Oximeter consists of pair of LEDs , red and infrared of two different wavelengths (660 nm and 940 nm)connected back to back and on the other side it has a photo detector. By placing the finger in between the LED and the photodetector, the ratio (R) between the intensities of two different lights is measured. A Pulse Oximeter is a

medical device that indirectly monitors the oxygen saturation of a patient's blood (as opposed to measuring oxygen saturation directly through a blood sample) and changes in blood volume in the skin, producing a Photoplethysmograph.

The proposed real-time Embedded Based monitoring system has a pair of light-emitting diodes (LEDs), one LED has a wavelength in red and other is in infrared region. The light was detected by a photodiode. The LEDs and photodiode are packed in Velcro strip such that it faces the patient's fingertip. The signal from the sensor is amplified and filtered and then sent to the microcontroller for measuring the levels. The data from microcontroller unit is sent to LCD and then to authorized person. Oximeter probes are designed to have multiple light sources (or different colors of LEDs) that are switched on/off during the measurement by the instrument. From this method, the SpO₂ and heart rate are calculated from detection of two kinds of light, i.e infrared and red LEDs.

3. WORKING

The Pulse Oximeter consists of pair of LEDs, red and infrared of two different wavelengths (660 nm and 940 nm) connected back to back and on the other side it has a photo detector. By placing the finger in between the LED and the photo detector, the ratio (R) between the intensities of two different lights is measured. A Pulse Oximeter is a medical device that indirectly monitors the oxygen saturation of a patient's blood (as opposed to measuring oxygen saturation directly through a blood sample) and changes in blood volume in the skin, producing a Photoplethysmograph. The proposed real-time Embedded Based monitoring system has a pair of light-emitting diodes (LEDs), one LED has a wavelength in red and other is in infrared region. The light was detected by a photodiode. The LEDs and photodiode are packed in Velcro strip such that it faces the patient's fingertip. The signal from the sensor is amplified and filtered and then sent to the microcontroller for measuring the levels. The data from microcontroller unit is sent to LCD and then to authorized person. Oximeter probes are designed to have multiple light sources (or different colors of LEDs) that are switched on/off during the measurement by the instrument. From this method, the SpO₂ and heart rate are calculated from detection of two kinds of light, i.e infrared and red LEDs.

4. CONCLUSIONS

The Requirement based oxygen feeding controller has been designed to monitor the heart rate and oxygen saturation. The system eliminate the use of excess of oxygen given to patient by measuring blood oxygen level and actuating oxygen whenever it is needed in controlled amount Data i.e. oxygen level will send through cloud to the user or doctor.

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