Pulse Oximeter Using PSoC

(SPONSORED BY K.S.C.S.T., BANGALORE)

A Project Report
submitted in partial fulfillment of the requirements
for the award of the Degree of
Engineering in Bio-Medical
of the Visvesvaraya Technological University, Belgaum

Submitted by

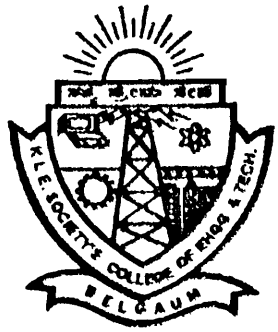
Sweety N. Gupta

Akhila Balwalli

Kavita Kagwad

Under The Guidance Of

Prof. Alok Prasad



Department of Bio-Medical Engineering

K.L.E SOCIETY'S

COLLEGE OF ENGINEERING AND TECHNOLOGY

UDYAMBAG, BELGAUM – 590 008

VISVESVARAYA TECHNOLOGICAL UNIVERSITY, BELGAUM

2008-2009

ABSTRACT

A Pulse Oximeter is a non-invasive device for measuring the percentage of arterial blood (or hemoglobin (Hb)) that is saturated with oxygen.

The principle of operation of a Pulse Oximeter is based on measuring the absorption of red and infrared light that passes through a patient's finger or ear lobe by utilizing light sensors. Hemoglobin that transports oxygen (oxy-hemoglobin) absorbs infrared wavelength (800-940 nm) of light and hemoglobin that does not transport oxygen (deoxy-hemoglobin), absorbs visible RED wavelength (600-700 nm) of light. Backgrounds such as fluid, tissue and bone are factored out of the measurement by monitoring the steady state of absorption from bone, tissue, venous blood and arterial blood. LEDs are used as the light source and are sequentially pulsed at a fast rate. During a heartbeat, blood volume increases and this AC component of the photodetector's current is used to calculate the absorption of oxy- and deoxy-hemoglobin.

Pulse Oximeter, is used in medical, sports training and home appliance applications. Knowing the percentage of hemoglobin that is saturated with oxygen is important to provide anesthesia, to determine the effectiveness of a patient's respiratory system, as well as help to diagnose various illnesses.