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Scientific Innovations & Research in Automation

To whomsoever it may concern

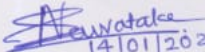
This is to certify that Mrs. Saroj Ruturaj Desai is pursuing degree 'Master of Engineering' in 'Instrumentation and Control' engineering from Vivekananda Education Society's Institute of Technology, Chemhur, Mumbai. Mrs. Saroj Desai is engaged in the project development activity of "Development of Semi-Automatic Blood Diagnostic Machine" since 19/10/2018 till 10/01/2020.

Specifically, she has worked and successfully completed the part of this project titled as 'Signal Conditioning and Data Acquisition System for Blood Diagnostic Machine' under the guidance of Mr. Shivaji S Nawatake, R & D Consulting Engineer, SIR Automation Industries, Navi Mumbai.

During the project execution, the work carried out by Mrs. Saroj Desai and Intellectual Property generated during the period will be owned by SIR Automation Industries.

We found her be sincere and diligent. We wish her success in her future endeavour.

Yours Sincerely


14/01/2020
R & D Consulting Engineer
Shivaji S Nawatake
SIR Automation Industries



V.E.S. Institute of Technology, Chembur

M.E instrumentation and Control

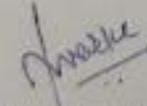
Project title: Signal Conditioning and Data Acquisition System for Blood Diagnostic Machine

Student: Mrs. Saroj Desai

Guide: Mrs. Nilima Warke

Abstract

A blood diagnostic machine is used for blood testing which is based on the spectrophotometric method. It is a process of *in vitro* testing for analysis of white blood cell counts complete blood counts reticulocyte analysis, and coagulation tests. The front-end circuit of the blood diagnostic machine consists of a light source, light detector-photodiode and transimpedance amplifier (TIA). TIA is used to convert the optical signal into a proportional output voltage. Various researchers have used separate photodiode and TIA circuit to measure absorbance for different wavelengths which made the circuit bulky and limited its application for measurement of specific parameters. TIA with a variable gain is required for precise measurement of a low strength optical signals. TIA becomes unstable when operated at high gain. So here, the TIA is designed with successively increased gain by choosing the different feedback resistors ranging from 1.5 k Ω to 1 M Ω to measure different strengths of the optical signal. The circuit is constructed and tested at different light intensities. Optical signal density up to 3.15 density units is measured with the designed TIA as per density measurement transmission strips certification. The performance of TIA is tested and found satisfactory.


(Mrs. Nilima Warke)