

# **Polluted Water Measuring Using a Novel Optical Sensor System**

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## **SUMMARY**

A new multispectral optical sensor system has been designed and developed for measuring total suspended solids (TSS) concentration in polluted water. New algorithm was developed to correlate pollutant concentration and the scattered radiation. The optical sensing system has been designed for measuring scattered radiation from water samples. In this study two infrared LEDs (890 and 875nm) are used as sensing emitters in case (1), two visible LEDs (626 and 660nm) are used as sensing emitters in case (2) and one silicon photodiode is used as detector in both cases and two convex lenses are used for focusing the radiations, also an electronic circuit was designed. The sensors were calibrated for measuring total suspended solids concentrations between the range of 110 and 500 mg/l. The results showed a good correlation between the radiation values and the total suspended solids TSS concentrations in all cases. The accuracy is high with  $R^2$  value of 0.99 in both cases and the root mean square error (RMSE) were 9.38 mg/l in case (1) and 8.77 mg/l in case (2).