Hadi Suntaya, 2012. Application of Multimode Fiber Coupler as a Height Level Sensor for Gasoline and Oil Based on Displacement Sensor. This thesis is under guidance of Samian, S.Si., M.Si. and Supadi, S.Si, M.Si., Department of Physics Faculty of Science and Technology University of Airlangga.

ABSTRACT

A research about application of multimode fiber coupler and a membrane which made from nitrile polymer as detection sensor of the height level of gasoline and oil have been done. The working principle of sensor based on the hydrostatic pressure and displacement sensor using fiber coupler. The mechanism of detection is done by detecting the pressure changes of gasoline and oil on the membrane which located at the base of the tank due to the changes of height of gasoline and oil. The changes of pressure on the membrane cause the membrane’s shape change from flat to convex. The change of membrane’s shape cause the changes of optical power of reflected light from membrane that received by the sensing port of fiber coupler. The changes of optical power are read through the optical detector's output voltage. The results show that there is a linear relationship between height level of gasoline and oil toward to the change of detector’s output voltage. This means that multimode fiber coupler and a membrane made from nitrile polymer can be applied as a height level sensor of gasoline and oil. Sensor parameters that obtained is resolution, dynamic range, and the linear region respectively are 0.5 cm, 4 cm – 74 cm, 24 cm – 74 cm for gasoline and oil. The value of sensitivity of sensor for gasoline is 28.57 (V/m) and for oil is 38.51 (V/m).

Keywords: Multimode fiber coupler, height level sensor of gasoline and oil