

## **ABSTRACT**

*Water content is an important parameter in coal analysis because the high value of water content due to coal mining carried out in swamps has a negative effect on the combustion process. This study designed a capacitance measuring instrument to determine the characteristics of 13 coal samples with different water content values. Capacitance measurement is done by connecting a capacitive measuring device with an inverting amplifier. The output voltage will be converted to the capacitance value using a linear regression equation. The input voltage used for each data retrieval is 4 V<sub>p-p</sub> with a frequency of 500 Hz. From the test results, the highest capacitance value is  $3,20 \times 10^{-9}$  F with a water content of 5.36% and the lowest capacitance value is  $3,14 \times 10^{-9}$  F with water content 7.96%. This proves that the capacitance value is not linear to the water content in coal. Many factors influence the output voltage value on capacitive sensors. These factors include the value of calorie content, carbon content, and ash content that tends to be high in coal so that the capacitance value of coal water content is not linear.*

**Keynote :** *Capacitive Sensor, Inverting operational amplifier.*