

## ABSTRACT

*Oil Palm Empty Bunches (EFB) is one of the materials that can produce G2 bioethanol, in the manufacture of G2 bioethanol the pretreatment process aims to separate lignin from OPEFB to produce and manage cellulose and hemicellulose. Pilot plant bioethanol g2 pretreatment temperature and speed of screw conveyor rotation can affect the results of the pretreatment process. Therefore, in this study, a design was carried out for controlling and monitoring the screw rotation speed and the temperature of the pretreatment process. The best test results were obtained for the variable input screw feeder at level 2, input elevated screw at 1 rpm, input screw out at 25 rpm, NaOH flow rate of 0.2 liters/minute, upper temperature limit of 170°C and lower temperature limit of 165°C. The Mitsubishi Q-Series PLC is used as a control system by creating a program in the form of a ladder diagram using the GX Works 2 software. For the monitoring system using the Mitsubishi HMI model GT2508-VTBA with parameters that will be displayed in the form of screw rotation speed and temperature readings using the PT 100 RTD Temperature Sensor. The HMI display also has a function as an input on/off and an RPM value to determine the speed of the screw conveyor.*

**Keywords:** *Bioethanol G2, OPEFB, Pretreatment, PLC, Sensor, HMI.*