

ABSTRACT

The number of Physics Engineering students who still do not know about (Programmable Logic Controller) PLC and (Human Machine Interface) HMI and their use in the industrial world. Designing a temperature control system that combines Mitsubishi FX3U PLC, Haiwell HMI, and RTD PT100 type temperature sensor. The purpose of this research is to design, implement, and test an accurate and reliable temperature control system in a device that requires precise temperature regulation. Therefore, a PLC-based water temperature control system using a double jacket system was made.

The methodology used involves several main stages, namely the design of the system, the creation of the control logic in the PLC using Mitsubishi's GX Works2 software and the creation of the interface design, system operation and display of data history directly from the HMI, in the Haiwell Cloud Scada Develop software. RTD PT100 temperature sensor is used to measure the temperature in this system and the received temperature signal is processed by PLC to retrieve the measured temperature data. Relevant temperature information is displayed through the HMI, which also provides the ability to set temperature control parameters.

The test results were able to control the temperature with an accuracy rate of 96.6%. The integration between the Mitsubishi FX3U PLC, Haiwell HMI, and RTD PT100 temperature sensor works well, allowing students to easily operate the system by monitoring and controlling the temperature as needed using only the HMI. In conclusion, this system still finds errors that continue to increase as the controlling temperature is high, this system can produce accurate and efficient temperature settings if there is a RTD PT100 sensor transmitter calibration tool in order to get accurate temperature readings.

Keywords - Control, Double Jacket, RTD PT100 Sensor, PLC FX3U, HMI Haiwell