

ABSTRACT

Development of information technology in the industrial sector gave rise to a new technology like ICS (Industrial Control System). ICS commonly applied in industrial areas such as power plants, natural gas processing and transportation. ICS development in line with the use of IP (Internet Protocol). ICS adopt information technology solutions to increase the capabilities and remote access connectivity. One application of the ICS is a SCADA (Supervisory Control and Data Acquisition). It's a method to control a plant separates tends to hundreds kilometers from the control center. Main SCADA components such HMI (Human Machine Interface), controller, network system, and acquisition system.

The early step of this Final Project is designing a SCADA system for monitoring and controlling the Boiler Drum. SCADA components to be used in this project is the HMI (Human Machine Interface), Controller, and Data Acquisition System. HMI was designed as a web based application that have User Interface features to display the status of each component in the system Boiler Drum. The Controller part Omron PLC CPIH used to control the boiler drum through the PLC I/O port. For data acquisition components used OPC-Server and Database Server to store data acquisition results.

The test results obtained from the SCADA system, network throughput between the OPC-Client and OPC Server is 1kbps, with the average delay is 150ms. For system control performance test, the results of the analysis show the application of the PI controller system in 3G network infratructure with $K_p = 4$ and $K_i = 0.181$ got undamped system with average maximum overshoot 8,762% % and average *error steady state* (e_{ss}) is 0.003%.

Keywords: SCADA, OPC, PLC, Boiler Drum, Wide Area Network