ABSTRACT

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Tittle : *Inter PLC Data Communication Using Internet Based Modbus Protocol*

This study aims to analyze the performance of communication between Programmable Logic Controller (PLC) using Modbus TCP protocol over the internet. Mitsubishi FX5U PLC as Modbus client and Omron CP1L-E PLC as Modbus server. Tests were carried out by measuring quality of service (QoS) parameters such as delay, jitter, throughput, and packet loss according to TIPHON standards, with variations in the delay time of each request, namely 10 ms, 25 ms, 50 ms, 70 ms, 75 ms, 80 ms, and 100 ms. The test results show that the delay is between 36 ms to 61 ms with an average of 45 ms, which gives a TIPHON index value of 4. Jitter varies between 10 ms to 86 ms with an average of 56 ms, giving a TIPHON index value of 3. Packet loss is mostly 0%, except at delay of 10 ms and 25 ms with a result of 0.1%, giving a TIPHON index value of 4. Thus, the delay time of 75 ms is the most optimal choice with a delay value of 40 ms, jitter 68 ms, and packet loss 2,9%. This inter-PLC communication system is proven to be optimal and can be implemented in an industrial environment with good performance.

Keywords : *PLC, Modbus TCP, delay, jitter, throughput, packet loss, industrial Communication*.