ABSTRACT

The development of the world of information and communication technology is driven by the needs and demands for changes in people's lives. Nowadays people want internet service access that is fast, easy, and practical. Therefore, optical fiber is used because of its large information capacity and high speed of information transfer. Fiber To The Home (FTTH) is a network technology that uses the internet connection by using fiber optic cable as the transmission medium. In FTTH networks use technology Gigabit Passive Optical Network (GPON). In this final project, the author designs a simulation model the expansion of FTTH network in the GPON using the software Optisystem by the method of Power Link Budget, BER value, and Q – Factor value. The method of two stage simulation expansion using a passive splitter 1:8;1:8, 1:2;1:32, and 1:4;1:16. The results of the expansion simulation in this study show that the Power Link Budget, BER, and Q – Factor value in the simulation of the expansion of the passive splitter 1:8;1:8, 1:2;1:32, and 1:4;1:16 on the design of categorized as feasible because it is in accordance with the feasibility standards of fiber optic networks, from this study showed that the comparison of the performance of the expansion of the transmission network FTTH use of the passive splitter 1:8;1:8 has better result than use of the passive splitter 1:2;1:32, and 1:4;1:16, where the comparison of the use of the passive splitter 1:4;1:16 is better than use of a passive splitter 1:2;1:32, and from this research it was found that with expansion of the transmission in the FTTH network planning, having the number of users on the FTTH network can provide services up to 64 users in GPON port and 2560 users for the GPON network.

Keywords : *Fiber To The Home (FTTH), Power Link Budget*, *Bit Error Rate (BER) , Nilai Q – Factor, Optisystem*