

ABSTRACT

Nowadays, the need for telecommunications, information and entertainment facilities that are acceptable and have high performance are very much needed. FTTH offers various advantages, its implementation still requires high costs for deploying optical fiber to every home or building. However, as technology advances and equipment costs decrease, FTTH is increasingly becoming a more affordable and attractive option for many internet service providers around the world.

To fulfill this, a network is needed that is able to support this performance. Based on the problems already mentioned, this research was conducted to analyze and simulate the performance of the Fiber to the Home (FTTH) telecommunications network in the Central Park Housing Complex, Surabaya City. Fiber To The Home (FTTH) is a new telecommunications technology that uses a fiber optic cable network to reach the customer's home. The speed of the FTTH network is not always smooth, testing is needed such as power measurements, one of which is the Link Budget calculation so that the installation results are as expected.

After calculating and simulating the power link budget using Optisystem, the initial results -36,327 dBm (farthest distance) and -32,311 dBm (closest distance) these results do not meet PT standards. Telkom and ITU-T therefore need to be optimized. After optimization, the results were feasible with -18,437 dBm (farthest distance) and -18,211 dBm (closest distance). These results met the feasibility standard limit, namely -28 dBm.

The NRZ rise time budget with a limit of 70% is achieved with 0.2260 ns in the downstream results and 0.2326 ns in the upstream results. Bit Error Rate (BER) $4,10193 \times 10^{-38}$ for the longest distance meets the maximum limit of 10^{-9} . In conclusion, FTTH network design is feasible based on power link budget, rise time budget and BER.

Kata Kunci: *FTTH, Link Budget, Optisystem, Bit Error Rate, Telecommunications.*