

## ABSTRACT

Telecommunications providers in Indonesia began to aggressively increase fixed broadband penetration through fiber optic cable with technology called passive optical network (PON). The challenge of providing fixed broadband requires speed and also the development of a reliable broadband network to minimize costs and also attenuation (loss). The methodology used in the design of the FTTH access network in this study uses a star configuration because it has advantages in easy installation and uses a dual stage passive splitter because it can maximize cable lengths up to 20 Km.

This calculation is carried out on the parameters of the feasibility and performance of the FTTH design system. Power Link Budget and Rise Time Budget for system feasibility. This value is calculated manually and compared with Optisystem. In addition, the other parameters are the Bit Error Rate (BER) for system performance. This parameter can be seen by making a simulation on the Optisystem.

The results of the design produced the value of the power link downstream budget of -14,652 and upstream -15,825 for the Cemara Cluster with manual calculations. For simulations on the value downstream Optisystem -20,533 and upstream -5,032 for the Cemara Cluster. Downstream power link value for Cempaka Cluster is -14,618 and upstream -15,925 with manual calculation. For the simulation on the Optisystem downstream value -20,569 and upstream -5,072 for the Cempaka Cluster. This value is still considered feasible because it is still above -28 dBm. For the calculation of rise time budget does not exceed the minimum limit of 70% NRZ and the bit error rate does not exceed  $10^{-9}$ .

**Keywords** : *Fiber to the Home, Loss, Rise Time Budget, PON, GPON, Passive Splitter*