

## ABSTRACT

*Satellite communication network design is often hampered by the complexity of performance-determining link budget calculations. Common parameters such as transmit power, path loss, antenna gain, and external environmental conditions collectively contribute to the user's challenge in understanding and performing proper link budget calculations which will result in the satellite communication network planning process being hampered and highly susceptible to an increased risk of calculation errors. Link budget miscalculations can lead to reduced data transmission rates and even communication service failures in areas that require satellite coverage.*

*To handle link budget miscalculations in satellite communications, a development platform is needed that supports these calculations. The platform used in calculating link budget parameters is web-based. Calculations using this platform have the advantage of being easily accessible. This website was developed to simplify the calculation of satellite link budget parameters through a comprehensive web-based interface, interactive visualization including satellite coverage, as well as simulation tools for transmitter signal level reduction, overcoming calculation complexity and increasing the efficiency of satellite communication system planning, which can be well received by users.*

*The test results show that the SkyLinkCal website is able to produce satellite link budget calculations with a high level of accuracy and consistency, comparable to manual calculations and AMSAT IARU Excel 2016 software . The visualization of orbital parameters displayed is also considered accurate and informative, with a comparison reference from NASA's GMAT. In terms of user experience, the questionnaire results using the System Usability Scale (SUS) method obtained an average score of 82.988, reflecting a high level of user satisfaction. In addition, performance testing shows that the website can run well on various devices, both mobile and desktop versions. However, testing for hardware shows that the attenuation value of 31.5 dB is not sufficient for path loss simulation, so further development is needed.*

**Key words:** *Antenna, attenuation, calculate, communication, hardware, link budget, orbit, path loss, planning, satellite, simulation, SkyLinkCal, software, website.*