Effects of PID Controller Location in the System Loop of Mobile Satellite Dish Network

Abstract

The effects of proportional-integral-derivative (PID) position controller location within the structure of network of mobile satellite dish spread all over Nigeria on system performance were investigated. The region of acceptable stability for the system was graphically determined in the integral gain, $Ki$ – derivative gain, $Kd$ plane for the determined value of proportional gain, $Kp$. Values for $Ki$ and $Kd$ were determined within the stability region. The determined values of $Kp$, $Ki$ and $Kd$ were slotted into the PID controller transfer function. The resulting controller was then connected to the system as series compensation and feedback compensation respectively.

After putting together the composite system transfer function for uncompensated, series compensated and feedback compensated systems, they were then subjected to a step input forcing function, which yielded time domain performance indices for these systems using MATLAB as a simulation tool. The obtained time domain performance indices for the uncompensated system, series compensated system and feedback compensated system show that the series compensated system has superior performance followed by uncompensated system and the feedback compensated system has the worst performance indices.
References


Index Terms

Computer Science

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Keywords

feedback compensated system Nigeria PID controller satellite dish network series compensated system stability region
uncompensated system