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THE NOVEL DESIGN AND DEVELOPMENT OF INTER SATELLITE LINK SUBSYSTEM FOR LOW EARTH ORBIT SATELLITES.

Abstract

The Satellite constellations have a special capability to provide unique and new applications such as cellular telephone networks, stable and high-speed internet over satellite, etc. The satellite constellation in the LEO orbit will provide many services at a reduced cost. So, the inter-satellite link is a vital subsystem in the satellite constellation. The Inter-satellite link (ISL) Transceiver is the core of the satellite platform in the satellite constellation, which is one of the most important subsystems in satellites. It is the link between the satellite, the Ground control station, and other satellites in the constellation, as well as working as a hub between the satellites. This paper will demonstrate the mission analysis of the constellation that determined the requirements of the ISL subsystem and all phases of design and development of the subsystem. The ISL subsystem operates in the S-band frequency, with a data rate up to 100kbp and RF output power of 1watt, using the CCSDS protocol.