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ADVANCED SPACE-BASED INTERNET-OF-THINGS (IOT) CONSTELLATION BRINGING HIGH
REVISIT & LOW LATENCY COMMUNICATION SERVICES

Abstract

Low-Earth-Orbit (LEO) satellite constellation for Internet of Things (IoT) is gaining momentum thanks to increasing market demand and new use cases. The IoT market size stood at USD 250.72 billion in 2019 and is projected to reach USD 1, 463.19 billion by 2027, a CAGR of 24.9

This paper introduces HEAD's Skywalker constellation, a LEO narrowband IoT satellite constellation with integrated payloads designed to provide advanced space-based IoT communication solutions.

The Skywalker constellation consists of 48 small satellites, with 12 deployed in sun-synchronized orbit (SSO) and another 36 in LEO, with 6 orbital planes and each plane deploying 6 satellites. Currently, the Skywalker constellation has 5 in-orbit satellites and another 16 scheduled to be launched - the full constellation when complete in 2023 will fly over intervals of 10 minutes or less with 60 north and south latitude. The satellites will be equipped with multiple payloads including a customized LoRa Data Collection System (DCS) payload, an AIS, an ADB-B and a VDES payload. The constellation aims at serving those area without terrestrial GSM coverage for various applications such as river monitoring, smart agriculture, utilities sector, Gas Oil, vessel monitoring, animal tracking etc, In an aggressive cost-efficiency model.

The solution comprises of a low-cost terrestrial IoT terminal (a handheld device) with a satellite module integrated and compatible to both terrestrial GSM and satellite network, designed to provide advanced narrow band communication services globally. The terminal works on LoRa interface by connecting to sensors and has dual interface of GSM and satellite, which cuts down significantly the costs of mass IoT practices and ensures the best data transmission service via secure, strong anti-interference, low cost and highly reliable data transmission channels.

The Skywalker fleet of satellites will augment business opportunities for relatively latency sensitive applications. This satellite-based monitoring solution provides businesses with the ability to connect IoT assets, offering ubiquitous tracking and monitoring of objects with limited or no access to terrestrial networks. The solution is fully customizable, scalable to suit any size of operation, fast to deploy and cost effective.

Skywalker's end to end solutions enhances the quality of mission critical applications by enabling comprehensive asset management, tracking, monitoring and control across various sectors including transportation, distribution, utilities, industrial fixed assets, oil and gas, maritime, mining and government markets.