System Requirements Document

MISSION

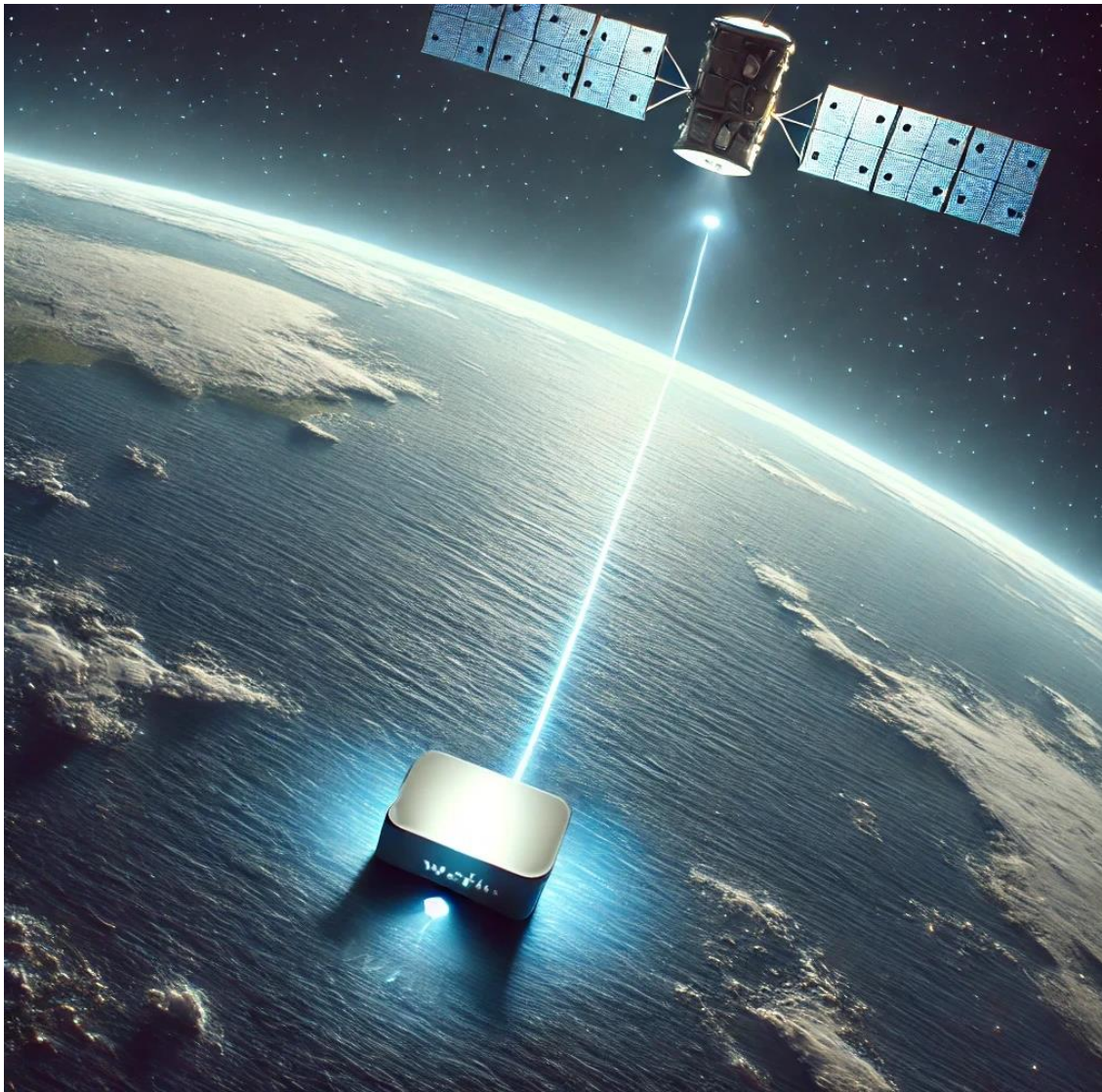
GOAL

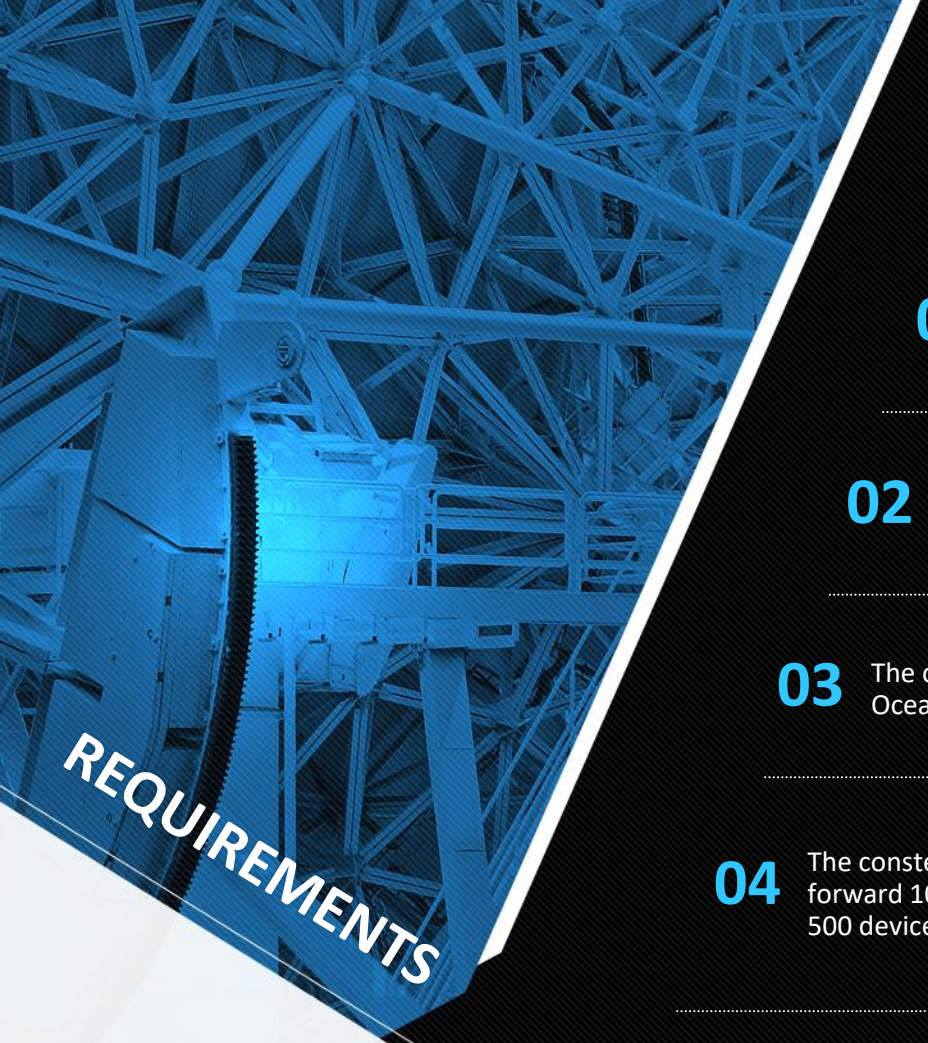
Constellation of LEO satellites that can provide coverage for 500 IoT devices being transported across the Atlantic Ocean

DURATION 10 years

PAYLOAD IoT communications and data management system

ADDITIONAL PAYLOAD For maximization of the usage





REQUIREMENTS

MISSION REQUIREMENTS

01 The operational lifetime of the satellites shall be at least 10 years.

02 The satellites shall orbit in LEO.

03 The constellation shall cover the Atlantic Ocean.

04 The constellation shall receive and forward 10 KB of data per device from 500 devices every two hours.

05 The constellation shall communicate with LoRa devices.

REQUIREMENTS

06 The satellites shall be microsatellites up to 25 kg mass and 400 mm X 250 mm X 250 mm envelope.

07 The satellites design shall follow the margin philosophy

08 All satellite components shall be COTS.

09 Satellites shall carry and operate an additional payload.

REQUIREMENTS

ATTITUDE DETERMINATION AND CONTROL SYSTEM REQUIREMENTS

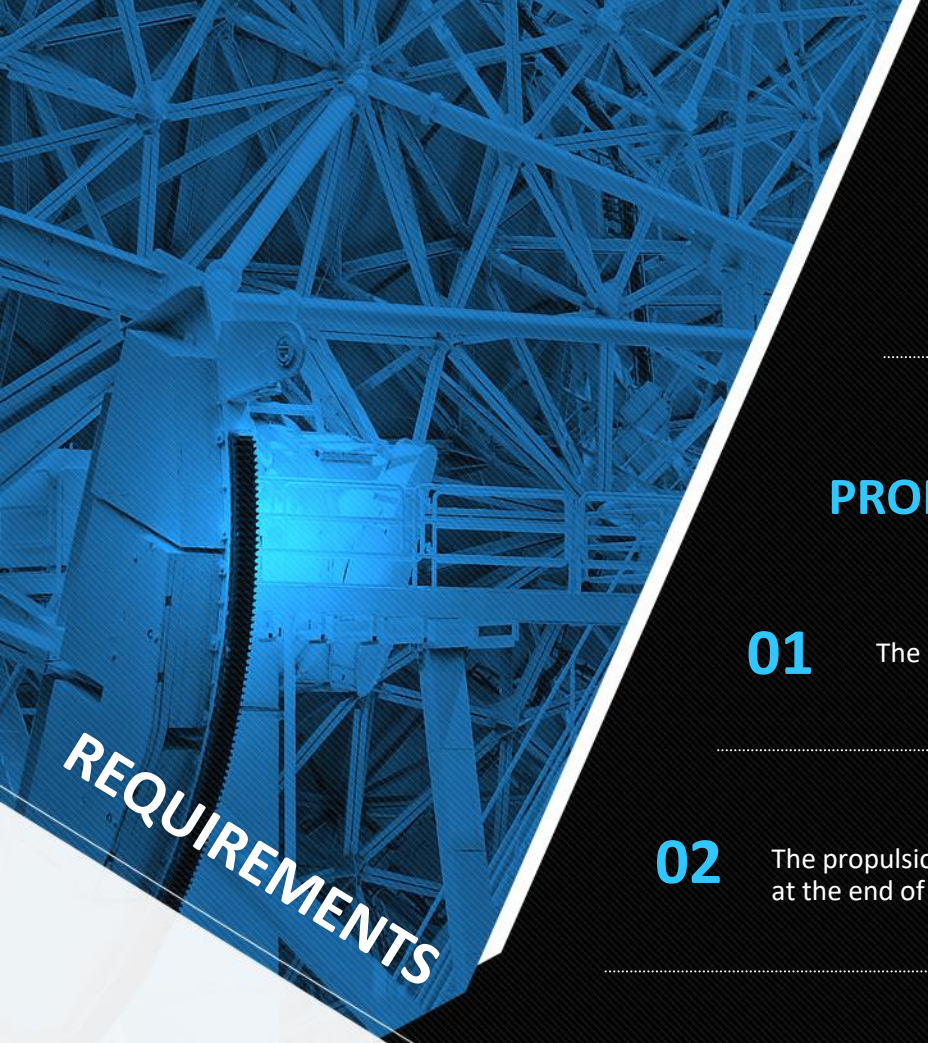
01 The satellite shall have the capability to determine its position throughout the mission.

02 The satellite shall be capable of reaching its orbit.

03 The satellite shall be able to maintain its orbit.

COMMUNICATION REQUIREMENTS

01 The ground Segment communication channel shall work with a bitrate up to 2.5 Mbit/s for the downlink, and up to 128 kbit/s for the uplink, at a frequency of 2 GHz, comprised in the S-band.



REQUIREMENTS

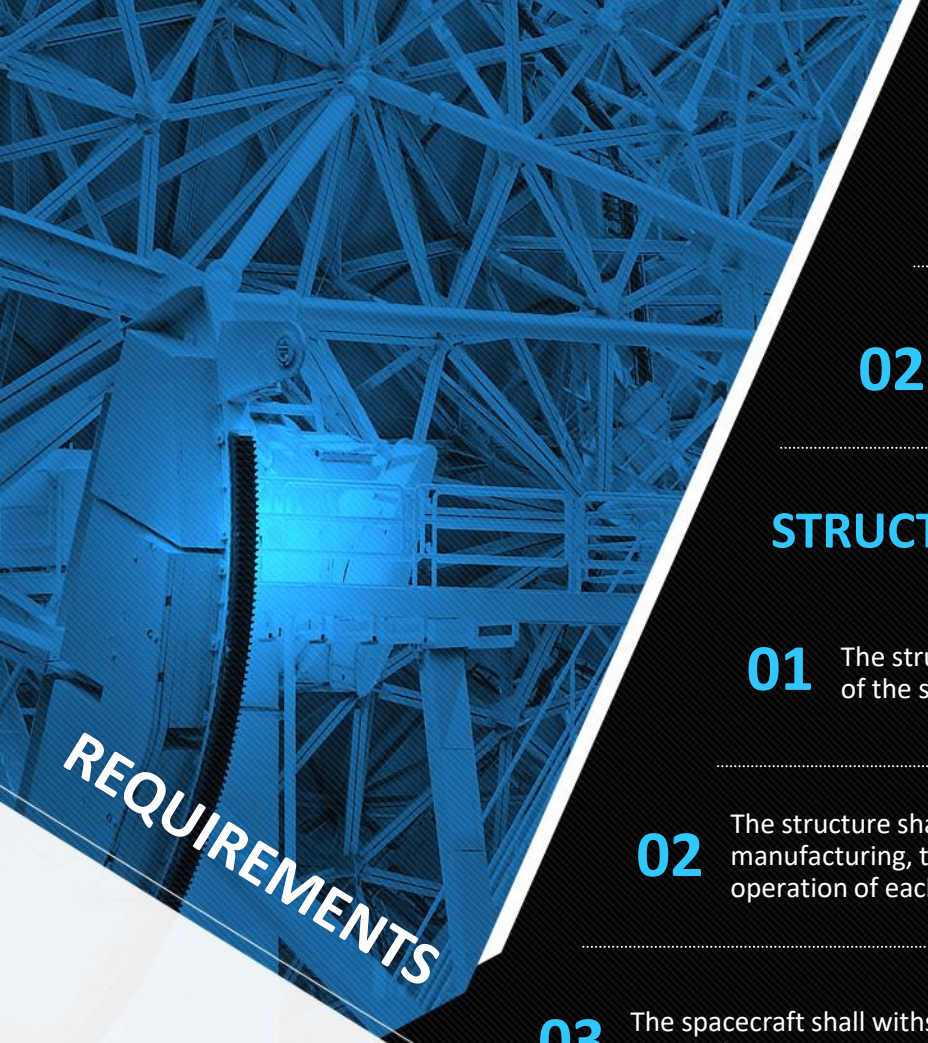
ELECTRICAL POWER REQUIREMENTS

01 The power subsystem shall ensure the operation of all essential systems simultaneously.

PROPULSION REQUIREMENTS

01 The propulsion system shall enable orbital adjustments.

02 The propulsion system shall enable deorbiting at the end of the mission.



REQUIREMENTS

THERMAL REQUIREMENTS

01 The spacecraft thermal control system shall cope with the space environment throughout the mission.

02 The thermal control provisions shall be able to maintain all subsystems within their nonoperational and operational temperature ranges.

STRUCTURE REQUIREMENTS

01 The structure shall store the payload and internal components of the satellite throughout its entire lifetime.

02 The structure shall distribute the loads produced during the manufacturing, testing, transportation, launch and in-orbit operation of each spacecraft with MOS.

03 The spacecraft shall withstand the mission's operational environment.

THANK YOU