

# ATMOSPHERE

## INTERNSHIP – UAV Control and Command over Satellite Networks

**Subject: Satellite C2 for UAV**

**Domains:** Satellite Telecommunication and Networks, Aerospace, Software

**Company:** ATMOSPHERE is a human size SME, which designs, builds and operates satellite connectivity solutions for aerial operations. ATMOSPHERE's mission management platform, PLANET, is deployed on a growing number of flight operators in Europe and North America. German office is running since 2010 to support local customers such as SAFRAN (Germany), DLR and German science community. In answer to market demand, ATMOSPHERE is also developing connectivity solutions for UAV.

### **Topic description:**

ATMOSPHERE has developed satellite connectivity solutions for UAV, based on legacy Iridium constellation. Current solution supports UAV control and command (C2) Beyond Line of Sight for one UAV type. The current solution is based on proprietary protocols. To address a wider market, the use of standard C2 protocols would be a must. The objective of the internship is first to analyse market trends to identify the most popular standard(s). Then to assess the feasibility to adapt current solution to support most promising C2 standards. A proof of concept (PoC) will be developed, including a complete end to end set-up with a UAV controller, a satcom link, and a UAV ground station.

### **Work Plan:**

- Requirements analysis
- State of the Art (C2 protocols: MAVLINK, MQTT, STANAG, ..)
- Protocol selection and design of the end to end system using existing components
- Implementation of a laboratory demonstration platform
- Performance evaluation
- Demonstration scenarios
- Documentation

### **Requirements :**

- Telecommunication and Networks background, Computer Science
- Fluent English

**Duration:** 4 to 6 months

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