

Call for Collaboration OSSAT Sensors and Actuators Market Study

CFC-0022 VERSION 01 RELEASED





Table of Contents

1	Document History	2
2	Applicable Documents	2
3	References	2
4	Work Package Description	3
5	Interested? Want to find out more?	5

1 Document History

Please see the following record of revisions:

Document Revision	Document Status	Change Description
01	RELEASED	New Document

2 Applicable Documents

The following references are applicable to this document.

Document Reference	Document Title	Date	Reference in this Document
KS-DOC-01076-01 <u>Open Source Satellite</u> <u>Programme Manifesto</u>		-	-

3 References

The following references are applicable to this document.

Document Reference	Document Title	Date	Reference in this Document
-	-	-	-



4 Work Package Description

WORK PACKAGE DESCRIPTION				
Project :	OSSAT			
WP Title:	:le: OSSAT Sensors & Actuators Market Study			
Supplier:	OSSAT Collaborator		Country:	Any
WP Manager:	Vicky Anderson		<u> </u>	
Start Event:	Project Kick Off	and/or Planned Start Date: TBD		TBD
End Event:	Presentation of findings	and/or Planned E	nd Date:	TBD
Objectives: To identify suitable, commercially available attitude determination and				

Objectives: To identify suitable, commercially available attitude determination and control system sensors and actuators to help define the interfaces required for the Open Source Satellite and for possible use on the first generation.

Task Description: A key element of the Open Source Satellite (OSSAT) is the attitude determination and control system (ADCS) which is responsible for determining the attitude of the satellite and providing the means to control the orientation of the satellite depending upon its application.

For the OSSAT, there are two key aspects that need to be addressed by this task:

- Identification of the interfaces used by ADCS components which would be commiserate with the OSSAT platform objectives. There are a wide range of interface types that are used by different ADCS components (RS-422, LVDS, SpaceWire, CANBus, etc.). The OSSAT is intended to be complementary with as broad of a range of interfaces as possible without compromising its design. Therefore, it is important to understand what the range of interfaces are so that a suitable down selection of the types of interfaces to be realised by the OSSAT platform can be made.
- 2. Identification of components that can be used in conjunction with the OSSAT platform.

Although it is intended that the full platform design of the OSSAT will be made open-source within one year of its first launch, the first generation of the OSSAT may need to utilise some peripheral units developed by third party organisations.



This may be necessary in order to achieve a timely first launch whilst such technologies are developed in-house for future variant's launches.

Therefore, the aim of this work package is to conduct a study of the current market for sensors and actuators which are fit for use on small satellites. Such units will be an integral part of the ADCS of the satellite and a good understanding of the available options will therefore be crucial in the design of the ADCS. The research should also take into account the proposed mass range of the OSSAT of 25-250 kg and how this may impact the unit selection. This study should include research into the commercial options for the following units:

- Sun Sensors
- Magnetometers
- Star Trackers
- Gyroscopes/Inertial Measurement Units (IMUs)
- GPS Receivers and Antennas
- Reaction Wheels
- Magnetorquers
- Thrusters for Attitude Control

A template spreadsheet with some of the key performance parameters for each unit will be provided as an input for this work package. The person completing the study should not however be constrained by the proposed parameters for each unit and will be free to include other performance metrics as they see fit. As an example, for a sun sensor the following performance metrics may be used to compare units from different suppliers:

- Mass
- Power
- Interface data
- Radiation tolerance
- Flight heritage
- Field of View
- Measurement update rate
- Accuracy
- etc.

The output of this work will be a completed spreadsheet summarising the results of the market study. Any additional documentation describing the findings will also be welcome, along with a collated set of datasheets for the different units. The work package will conclude with a presentation to the OSSAT programme community.

This work package could be split between multiple collaborators as the different sensors and actuator items can be considered independently of each other.



Inputs: A spreadsheet template that lists the types of sensors and actuators the OSSAT will require and the performance parameters that KISPE Space are interested in.

Interfaces/links with other	Applicable requirements, standards, regulations,
tasks or WPs: None	constraints: None

Outputs:

- 1. A spreadsheet that documents the market options for each of the sensor and actuator types including values for the key performance parameters.
- 2. A presentation to the OSSAT programme presenting findings.
- 3. Suggested follow-up work.

Indicative Effort: 1-2 weeks.

5 Interested? Want to find out more?

Register your interest at <u>www.opensourcesatellite.org/register/</u>, putting "**CFC-0022**" in the "Other" free text box in the registration form.

Thank you!



www.opensourcesatellite.org

in linkedin.com/company/open-source-satellite

🕑 @SatelliteOpen

✓ info@opensourcesatellite.org