IAF EARTH OBSERVATION SYMPOSIUM (B1)
Earth Observation Sensors and Technology (3)

Author: Mr. Mikolaj Podgorski
Scanway sp. z o.o., Poland, m.podgorski@scanway.pl

Mr. Aleksander Gorgolewski
Scanway sp. z o.o., Poland, a.gorgolewski@scanway.pl
Ms. Agnieszka Przybylska
Scanway sp. z o.o., Poland, a.przybylska@scanway.pl
Mr. Leszek Kogut
Scanway sp. z o.o., Poland, l.kogut@scanway.pl
Mr. Paweł Żukowski
Scanway sp. z o.o., Poland, p.zukowski@scanway.pl
Mr. Hubert Hodowaniec
Scanway sp. z o.o., Poland, h.hodowaniec@scanway.pl
Mr. Dominik Hura
Scanway sp. z o.o., Poland, d.hura@scanway.pl
Mr. Andrzej Jałowiecki
Scanway sp. z o.o., Poland, a.jalowiecki@scanway.pl
Mr. Jedrzej Kowalewski
Scanway sp. z o.o., Poland, j.kowalewski@scanway.pl
Mr. Michał Zieba
Scanway sp. z o.o., Poland, m.zieba@scanway.pl
Mr. Konrad Pleban
Scanway sp. z o.o., Poland, k.pleban@scanway.pl

EAGLEEYE VLEO MISSION - IMAGING PAYLOAD WITH 1 M GSD

Abstract

This paper describes results of tests of engineering model of Imaging Payload of EagleEye mission. The EagleEye will serve as an In-orbit demonstration (IOD) of both the platform and payload at the end of 2023. The main novelty of this payload is the ability to acquire 1 m resolution (Ground Sampling Distance) from 350 km very low Earth orbit (VLEO) in both VIS and NIR. To ensure that the desired operational parameters will be achieved, and the orbit will be maintained through the mission's lifetime, the platform – develop by other entities working in consortium with Scanway – will be equipped with an engine for orbital corrections. Imaging Payload will consist of telescope based on Ritchey-Chretien design with 200 mm aperture of aluminum primary mirror and small depth (along the optical path) to ease the integration with the platform. Such design constraints mean that there is quite unique approach for design and integration of optical path. Since relative position of each optical element must be maintained within very strict margins, mechanical structure needs to be as athermal as possible. Thus, composites and titanium were selected for this task, while composites playing the biggest role in the mechanical design and keeping the payload at very low mass, below 10 kilograms including interfaces. The payload was developed to acquire in a simultaneous way images from VIS and NIR through the same telescope aperture with the use of two separate CMOS CMV12000 sensors. Dual sensor approach is in line with project's methodology of using ITAR-free and COTS elements (and sensors) which is a huge advantage

in relation to project's budget and timeline. This paper is focusing on first tests results regarding not only optical tests of the Imaging Payload, but also flatsat integration with platform, vibration and TVAC tests of whole Imaging Payload and platform. System engineering and model based engineering of this project will be described, along with the information how the team managed to reduce the number of tests. Moreover, parts of the payload were flown to space in STARVIBE mission in Q2 2022 with our partner, therefore they reached TRL 9 already. Preliminary results, if possible, will be also shared within the paper. They will mostly include the CMOS sensor behaviour in space and read-out electronics status. All test results from EagleEye will be verified through CDR in Q4 2022 and after that, building of flight model will begin.