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Space Systems and Architectures Featuring Cross-Platform Compatibility (7A)

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COST REDUCTION FOR SMALL SATELLITE CAPABILITIES THROUGH STANDARDISATION:
PROBA-NEXT PLATFORM

Abstract

Building further on the flight heritage of the successful European PROBA missions (flying in orbit), QinetiQ Space focuses on proposing to the space community a standardized platform allowing a fast and reliable development cycle for high performance missions at a reduced cost.

In collaboration with the European Space Agency (ESA), the PROBA-NEXT platform offers a balanced mix of performance and robustness providing a flexible design allowing for wide range of application across LEO environment from 400km to 1000km. Through its modularity, PROBA-NEXT platform allows for a “design-to-user” approach where functionalities and subsystems can be selected by the customer depending on its needs. Proposing standard interfaces based on a generic spacecraft structure, the platform provides sufficient flexibility to accommodate many kinds of payloads (telescopes, communication, fluid equipment, ...).

Focusing on a cost reduction, the PROBA-NEXT platform aims at long term re-usability for future missions. It will for instance allow the customer to skip parts of the verification campaign like qualification of the structure or electrical compatibility of avionics. As a result, it will afford delivering up to 30kg of Payload for spacecraft mass of 150kg equipped with de-orbiting and orbit maintenance capabilities. Combined with experiences acquired both the agility and pointing performance of 5arcsec are a key element making PROBA-NEXT platform a good candidate for science and observation at very low cost.

This paper will cover all aspects of the spacecraft system design and detail some of the wide range of applications possible with this platform. Modularity and standardization aspects will be presented while showing a notable compliance to the ESA Standard (ECSS). This combination allows a rapid but stable development intended to be from kick-off to launch a three years project. Recommendations will be provided on interface standardization (mechanical, thermal, avionics and software) to allow efficient project cost reduction. Finally, throughout variable mission examples the main reconfiguration abilities available when flying with PROBA-NEXT platform will be demonstrated.