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

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P-400: A STANDARDIZED SMALL SATELLITE BUS FOR DEMANDING MISSIONS

Abstract

In view of the increasing demand for small satellite missions, QinetiQ Space has developed a number of small satellite missions in close collaboration with ESA. PROBA-1, which started as a technology demonstration mission for on-board autonomy, is currently still an operational Earth observation mission providing hyper-spectral images to thousands of scientists around the world. With its 13 years of in-orbit operations, it exceeded by far the original 1 year imposed mission lifetime. PROBA-2 again started as a technology demonstrator and is currently operated in ESA's SSA program, providing valuable space weather data on a continuous basis. The latest satellite launched in the series is PROBA-V. With this mission, QinetiQ Space demonstrated the PROBA platform has evolved to a fully operational platform; after its successful commissioning, PROBA-V now serves as an operational Earth observation mission to provide continuity in vegetation data, which were previously delivered by CNES' SPOT 4 and SPOT 5.

Through these three mission, the PROBA platform has accumulated over 20 years in orbit, without failure on any of the launched satellites, showing the great potential that small satellite missions have.

Following the successes of the PROBA missions, an activity has been started to develop the next generation of PROBA satellites. Two models of the standardized bus are being developed: one for serving the 200kg mass range, the other capable for satellites up to 400 kg.

The new developments are made with 1 main goal in mind: making the platform suitable for a multitude of missions at a commercially attractive price, while maintaining the quality and robustness of the PROBA platform according to the ESA standards. The developments are focused on the high performance core elements of the satellite, complemented by mission specific elements and with the capability to carry a variety of payloads. The envisaged approach, based on modularity and standardization, shall also lead to a reduced development time.

This paper describes the P-400 core bus, which is intended for demanding missions in the 400kg mass range.