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Access to Space for Small Satellite Missions (5)

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THE INTERNATIONAL SPACE STATION AS LOW-COST HOSTING PLATFORM FOR LEO
MISSIONS USING THE NANORACKS EXTERNAL PLATFORM

Abstract

The utilization of low Earth orbit (LEO) for space-based missions has seen significant dynamics in the last years. The number of payloads launched and missions conducted has increased exponentially. But the use of LEO is still constrained by the rare availability and high cost of access to orbit, especially for small payloads. Although many systems to launch small satellites into orbit are currently in development, the situation for small payloads is expected to aggravate in view of the actual end of service of the Russian ballistic missile based launchers Dnepr and Rockot. The market requires a reliable and low-cost access to LEO in the short term which cannot be provided by new launch systems currently in development. Airbus Defence and Space and NanoRacks LLC have teamed to change economics of space access in favor of our customers with the External Payload Platform (EPP) accessible for CubeSat size payloads on a commercial basis. The platform allows the robotic installation and operation of CubeSat form factor payloads. Payload items are transported among the cargo usually delivered to the station. Due to the frequency of flights and flexibility of manifests the risk of delay in payload readiness can be mitigated by delaying to the next flight opportunity which on average is available every two months. Every payload can extensively use all ISS resources: mass is not limited, power only limited by the payload heat radiation, the datalink is a USB 2.0 standard bus enabling a near real-time and private data link. This solution can be used to completely replace the satellite platform and to perform the mission as hosted payload on the ISS. The access to EPP is designed as end-to-end service with very limited interfacing effort to the ISS. Thereby, it fosters attractiveness of using the ISS for customers with limited experience in space system engineering. Based on the ISS orbit and resources various mission scenarios can be realized, among them remote sensing for which EPP is an ideal platform. The potential of the ISS and EPP system for commercial LEO-based missions is presented in detail. The EPP will be launched to the International Space Station (ISS) and installed in the third quarter of 2015. It will be ready to be used by the small satellite community at the beginning of 2016. The present status and launching customer mission are outlined and next steps of the hosting concept discussed.