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

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ASTRIUM SATELLITES PRODUCT LINES FAMILY FOR EARTH OBSERVATION

Abstract

Astrium Satellites has a long history of successful definition and implementation of satellite product lines, shown by the applications to Earth Observation Science missions of the Myriade, Spot, AstroSat 500 and FlexBus series. Based on this large experience, Astrium has defined the AstroBus platform product lines with the key objective to foster reuse at all levels (satellite, platform, function, equipment). Risk reduction, quality and robustness increase, schedule improvement and cost reliability are the main benefits of product lines application, gained through continuous feed-back from lessons learnt. The AstroBus family covers the platform needs for of Earth Observation missions for both Low Earth and Geostationary orbits and encompasses several product lines. This paper presents the approach followed for establishing the AstroBus family and focuses on the definition of AstroBus-L product line for Low Earth orbits. AstroBus-L product line targets both the institutional missions from the European and National Agencies and the export applications, and covers the following range of missions: Orbits from 400 to 900 km, Sun Synchronous at various Local Time Ascending Nodes or even non Sun Synchronous; payload mass from less than 100 kg to 1 ton, power consumption from less than 100 W to several KW and lifetime up to 10 years. The AstroBus-L Platform Product definition is segmented for a large application domain. The segmentation is driven by the offered platform resources. It offers full flexibility for adaptation and compliance to specific mission needs. The AstroBus-L definition is fully compliant with the reference European Customer standards, the ECSS referential notably; possibilities of tailoring are also available for the Export Market. The full ability to accommodate equipment from different suppliers depending on customer wishes and to support geographical return constraints is a key feature proposed by the AstroBus-L platform. The AstroBus platform modular architecture provides flexibility for customisation, relying on a standard functional architecture and standard interfaces. A baseline operations concept is designed and building blocks are proposed as non-scalable (e.g. on-board computer) or scalable building blocks (e.g. power conditioning and distribution). A portfolio of standard mechanical platforms is maintained, covering different payload and mission needs. This paper describes the main characteristics of the AstroBus-L standard product definition, its application on programmes and its perspectives. The close relationships established between the AstroBus product lines developments conducted by Astrium Satellites and the on-going Product Policy initiatives from ESA and National Agencies are also presented.