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A GENERIC SATELLITE PLATFORM FOR HIGH PERFORMANCE LEO MISSIONS - LEOBUS-1000

Abstract

The LEOBUS-1000 is OHB-System's generic satellite platform for low Earth orbit missions using small launchers. It is developed from the EnMAP satellite, a hyperspectral Earth observation mission under contract of the German Space Agency DLR, currently being in phase C/D. EnMAP is in turn based upon the heritage of OHB-System's five successful SAR-Lupe satellites. This implies that the generic platform of LEO-BUS1000 has a cumulated in-orbit heritage of more than 12 years.

The LEOBUS-1000 is mainly designed for Earth observation missions having spacecraft masses in the 600-1000 kg class, and lifetimes of 5-7 years. Among its advantages is a very flexible power generation configuration; it can incorporate fix solar panels, deployable and fix panels or Sun pointing panels, all depending on the payload power and duty cycle requirements. The platform can support payloads with average power demands of up to 1 kW. Furthermore, a highly accurate and agile attitude control concept together with a high rate payload data on-board processing and downlink system (up to 900 Mbit/s downlink and 1 Tb memory), provides a good foundation for high performance payloads. LEO-BUS1000 is suitable to payloads weighing up to 450 kg and is compatible with most small sized launchers including PSLV, VEGA and ROCKOT.

LEOBUS-1000 also offers an easy and parallel assembly, integration and test process, due to its complete separation of payload compartment and platform. It provides a cost-effective approach, high reliability even after 7 years of operation and a low development time due to its extensive heritage.

The paper describes the LEO-BUS1000 platform, starting with its heritage and design, and continuing with cost-effective configuration options for meeting different payload requirements such as power, duty cycle, pointing performance, data downlink, mission orbit etc. As a final point, the paper summarises the key performance figures of the platform.