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AIRBORNE BASED SERVICES FOR THE DEVELOPMENT OF NEW EARTH OBSERVATION
PAYLOADS FOR SMALL SATELLITE MISSIONS

Abstract

Currently, the demand for small satellites is increasing strongly. In addition to cost advantages in manufacturing and during operation, the increasing extension of small satellites will also favor a faster technical renewal of the used payloads. Also operation of constellations and mega-constellations will become economically feasible. Due to the technical progress especially in instruments for Earth observation in recent years, novel and high-performance Earth observation systems with ground resolutions below 50 cm, video-like temporal resolutions and response times below one hour should be feasible in the medium term. These new capabilities, together with the accelerated market, place new and challenging demands on technical development processes. To support developments in the area of airborne and satellite-based earth observation, OHB Digital Connect GmbH operates a real-time capable test environment for more than 10 years. This environment is used to test active and passive optical instruments and components for data management and methods and algorithms for fully automated mostly real-time data processing, to demonstrate their performance and to evaluate them. It is also intended to be used for calibrations and validations for Earth observation satellites and could potentially be used for special remote sensing tasks, e.g. airborne remote sensing in the event of disasters. The test environment consists of the airborne system Condor, the high-rate data link ARDS (Aerial Reconnaissance Data System) and the transportable and decentralized ground system mAROC (Mobile Aerial Reconnaissance Operation Center). The Condor's platform is a Stemme S10 VTX, a motorized glider operated in cooperation with Stemme AG under a permit-to-fly. The Condor can be equipped with modular containers, so called Wingpods, on both sides under the wings. The Wingpods can be equipped with several instruments as well as control electronics. For this purpose, they have a standardized mechanical interface, provide an electrical supply and have a 10Gbit interface into the cockpit. Furthermore, a 19" rack is available in the cockpit, in which e.g. components for on-board data processing can be integrated. By operating under a permit to fly, the Condor can be quickly and cost-effectively rebuilt to new configurations in the Wingpods and in the cockpit. OHB Digital Connect GmbH presents the work carried out to date in the area of Airborne Campaigns - the earth observation in situ solution in the context of current developments in the field of end-to-end earth observation and highlight the potential for future developments in this area.