

29th IAA SYMPOSIUM ON SMALL SATELLITE MISSIONS (B4)
Generic Technologies for Nano/Pico Platforms (6B)

Author: Mr. Tomas Valer
Czech Republic, tomas.valer@bdsensors.cz

Mr. Luciano Battocchio
Czech Republic, luciano.battocchio@bdsensors.eu

BDSAT: A CUBESAT BASED PLATFORM FOR EXPERIMENTS AND IOD MISSIONS

Abstract

BD SENSORS is a Czech SME operating, through its Space division CSRC, in Space business since more than 25 years for design, development and MAIT of Space electronics. More recently BDS invested in Design, Development and MAIT of a small satellite, cubesat class, named BDSat. The main purpose of BDSat is the development of system level capabilities and know-how in BDS, in order to increase the Company's competitiveness in ESA Programmes. Primary goal of BDSat project is an IOD - In Orbit Demonstration Mission for two BDS technologies. BDS is one of the world leading Companies in the production of Pressure Sensors for almost every terrestrial application, from food industry to automotive or oil extraction. Therefore, the first technological IOD is the verification of pressure sensor prototypes, to verify their functionality in open space, in order to propose it for use in space applications. There are 3 types of pressure sensors, two analogues with voltage output, and one with digital output and active temperature compensation. The second technological IOD is the verification of the utilization in space environment of a supercapacitor bank as a modern approach to energy storage in satellites. The supercapacitors bank will be charged with energy from solar panels through the Power Supply Unit during the solstice; the stored energy will be utilized during the eclipse and to provide power to pressure transducers. The Technology IOD mission will consist of regular monitoring and data collection to check proper functioning of the pressure sensor and the supercapacitors bank, their temperature dependence, and degradation influenced by time and by radiation. The ground station will be located at the co-investigator CEITEC VUT (Institute of Brno Technological University), which will provide the commands to- and the monitors from the satellite. Secondary goal of BDSat is to support radio amateurs' community with several HAM services and activities. Launch of BDSat is foreseen in April 2022 from KSC through a Falcon 9 launcher. It is well known that, despite their small size and weight, Cubesats are taking over some roles of the larger satellites as low-cost option for developing and testing new technologies in space. Therefore, successful BDSat mission will open promising future possibilities, since BDSat could be utilized as a platform for low-cost experiments, or for technological IOD missions. The paper will describe in detail the characteristics of the BDSat and the main results obtained during its on-orbit activity.