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TEST SYSTEM FOR FUNCTIONAL VERIFICATION OF A SBCDA/ARGOS-2 RECEPTOR - STUDY  
OF CASE: ENVIRONMENTAL DATA COLLECTOR

**Abstract**

Since 1993, the Brazilian Environmental Data Collection System (SBCDA) provides a free service of messages forwarding through environmental monitoring and life's protection's satellite. Data Collect Platform (DCP), from the users, transmits messages with the data from sensors to the system's satellites for a Platform Transmitter Terminals (PTT) with ARGOS-2 pattern. The satellites retransmit the messages for the Ground Stations (GS) that forward the message to system's users. The system's applications can be the water monitoring, climate study, animal tracking, agriculture and a lot of other examples. With the idea of the SBCDA modernization, the Brazilian Institute for Space Research (INPE) is developing the CONASAT-0, the first nanosatellite of a Cubesat's constellation that will replace the current satellites. The CONASAT-0 is a 1U Cubesat with the Environmental Data Collector (EDC) as a payload, the EDC is a SBCDA data receptor. The EDC decodes the messages from DCP and send them to the satellite's onboard computer, that will send the messages to a GS multiplexing the data in the satellite's telemetry channel. Space missions are expensive and cheaper alternatives are welcome, so there is a trending of the qualified components replacement for a Commercial off-the-shelf (COTS) in space systems. With that, also have been proposal techniques to minimize the reliability lost in COTS systems, with that, the numbers of system with the COTS architecture has been increase in the past years, the CONASAT-0 and the EDC are a example of mission and payload with COTS components. The main EDC's process unit is a FPGA SoC SmartFusion 2 that has a built-in microcontroller, the FPGA and the microcontroller are used to process the data. The verification and validation process is a important step in the development of any technologies, this article bring the test plan to the functional verification, performance measurement, test desk and the primary results of the EDC's tests.