EARTH OBSERVATION SYMPOSIUM (B1)
Earth Observation Data Management Systems (4)

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A NEW GROUND SEGMENT FOR SMALL EARTH OBSERVATION MISSION (DEIMOS-2)

Abstract

The Ground Segment is designed to handle the operation of Earth Observation satellites with agile platforms and medium or high resolution optical instruments.

The first mission to use this system will be the Deimos-2 satellite, equipped with a 1m high resolution optical instrument and 12km swath mounted over an agile platform able to quickly point to the desired target.

The GS has been designed according to the following main drivers:

" Minimal operation costs, enabling the complete handling of all the spacecraft operations and the processing of the payload data with the minimum number of operators and reduced HW and maintenance costs. It also allows the remote operation of all of its components.

" Quick response to emergency acquisitions, allowing reprogramming the satellite operations in very short time, even in the same orbit of the acquisition and to download and process the corresponding images in near real time.

" Deployment flexibility, allowing to install the ground systems in different locations and using different sets of ground stations, both for monitoring and control and payload data reception.

" Expandability. Eg. the Deimos-2 GS is a modular system allowing adapting its capabilities to future needs (for instance new processing levels or collaboration with external missions).

" Secure access to all of the GS elements with different user's roles and privileges.

This GS is a complete system that includes all the elements needed to monitor, control and exploit the mission:

" Flight Dynamics for orbit determination, S/C manoeuvring and collision avoidance functions.

" Mission Planning for generating the S/C schedules based on the users inputs and emergency requests.

" Monitoring and Control for commanding the S/C and handle its telemetry and complete monitoring of all GS elements.

" A complete Ground Station S-band and X-band system to handle the S/C communications with the possibility to use third party stations.

" Archive and Catalogue for storing all the mission data and allowing the use of confederated deployment of separated instances.

" Product Processing elements for L0 processing up to automatic and/or manual orthorectified L1 products, with the possibility to add new levels to the processing chain.

The design has taken advantage from the ample experience on developing ground segment elements for other missions and the previous Deimos-1 optical mission to create a new and improved system that will be used to not only support the Deimos-2 mission, but future Deimos and third-party missions.