



CS GROUP'S ESPACE BUSINESS UNIT

MAPS MISSION AND PROGRAMMING SOFTWARE

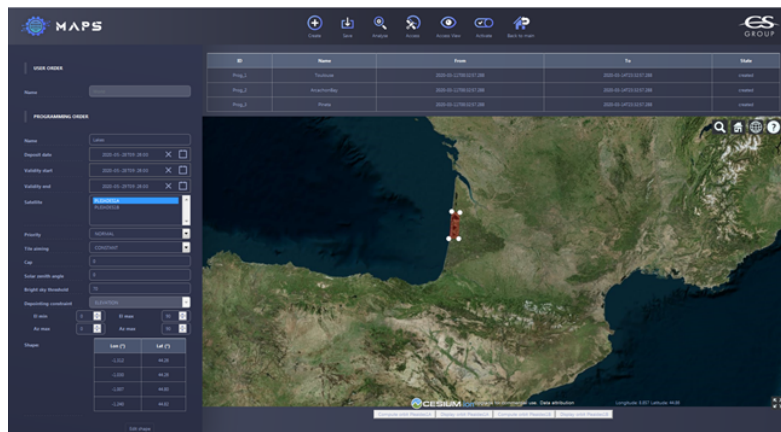
Based on its long-term experience developing and integrating Mission Planning & Programming Systems, and taking into account the New Space requirements (faster development, simpler deployment and cost reduction), CS has built **MAPS**, a reusable software suite for Nano satellites missions, by developing a web application product to be used as a simple but powerful MPS. **MAPS** is adaptable to every observation mission needs, portable and easy to deploy.



CS GROUP MISSION TEAMS HAVE BEEN DEVELOPING MISSION PLANNING SYSTEMS FOR MORE THAN 30 YEARS, FROM DESIGN PHASE TO OPERATIONAL DEPLOYMENT.

MAPS UP TO NOW

- ✓ To meet the growing needs of our customers to have generic mission software, at low cost and easy to use, CS GROUP is developing the **MAPS** product (Mission And Planning Software).



- ✓ **MAPS** is dedicated to constellations of Earth observation satellites and allows the user to programming images from a 3D map based on Cesium. The Web app GUI is intended to be easy to use for the maximum of needs.
- ✓ Once the mission is programmed by the users, several algorithms are linked together to check images feasibility, define their prioritization and create an acquisition plan. The user can then check which images will be taken. An operator view allows modifying the plan created, in the event of an urgent acquisition to be programmed.

MAPS FUNCTIONALITIES

User Requests Management

- User-friendly interface to define new requests based on a set of criteria. Possibility to import requests files. Requests area may be defined directly on the map.
- User-friendly interface to access catalogue and identify available products.
- Access opportunities analysis and search (taking into account depointing constraints with Orekit).
- Handling of requests lifecycle from creation to Imagery production request.
- Graphical and list display of requests.
- Possibility to define early-bird / late requests.

Mission Plan Computation

- Elaboration and follow-up of Mission Plan:
- Multi-users service census.
- Automatic ranking of requests by combining several entries (priority, depointing constraints, end of validity period, weather forecast, etc.).
- Resources optimizations, kinematics / dump plans computation.
- Possibility to visualize and modify the computed Mission Plan
- Display of user requests status.
- Scheduling and execution of Mission Plan:
- Programming of satellites pictures, automatic scheduling of plan execution, generation of operations sequences (CCSDS standard).

Users management

- Management of external users (customers) and operational users (satellite provider/ operator).

MAPS INTEGRATION WITH OREFLIDS PRODUCT



MAPS is designed to easily integrate with **OreFLIDS**, the **CS GROUP** Flight Dynamics System for any types of satellites and constellations. In particular, **MAPS** gets data from OreFLIDS (ephemeris, events, visibilities, maneuvers) and provides sequences and mission slots to OreFLIDS.

OreFLIDS provides both a set of generic Flight Dynamics algorithms and an infrastructure to integrate and support them. New complementary algorithms may be easily added to OreFLIDS.

KEY POINTS

- ✓ CS GROUP recognized experience in the space domain
- ✓ Use of state-of-the-art technologies
- ✓ Use of open-source tools
- ✓ Easy to learn and use
- ✓ Multi-user functionalities
- ✓ Plug&Play algorithms
- ✓ A solid and innovative product roadmap
- ✓ Integrated both SSU and CPM in a single simplified tools

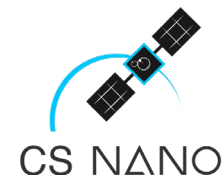
TECHNOLOGIES



MAPS INTEGRATION WITH CS NANO PRODUCT

MAPS is designed to easily integrate with **CS NANO**, the **CS GROUP** Ground segment solution for nanosatellites and constellations. In particular, **MAPS** provides a Mission Plan defined in CCSDS standard to send to satellites.

CS NANO is extensible (possibility to add components), scalable (Distributed Architecture, services & components oriented), adapted to NEWSPACE constraints (Constellations, Nanosats/cubesats, Electrical Propulsion, etc.).



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