



Features

- ✓ Plugged-in FDS modules
- ✓ Integration with Ground Segment solutions
- ✓ Scalable for constellations and multi-satellite missions
- ✓ Automation via scheduled batch scripts
- ✓ Maneuvers History
- ✓ Execution Contexts, Users and Configuration Management
- ✓ Backup & Redundancy

Technology stack

- ✓ OpenJDK
- ✓ Orekit & Hipparchus
- ✓ Spring Framework
- ✓ Angular
- ✓ PostgreSQL
- ✓ Apache CXF
- ✓ ActiveMQ

OreFLIDS Flight Dynamics System

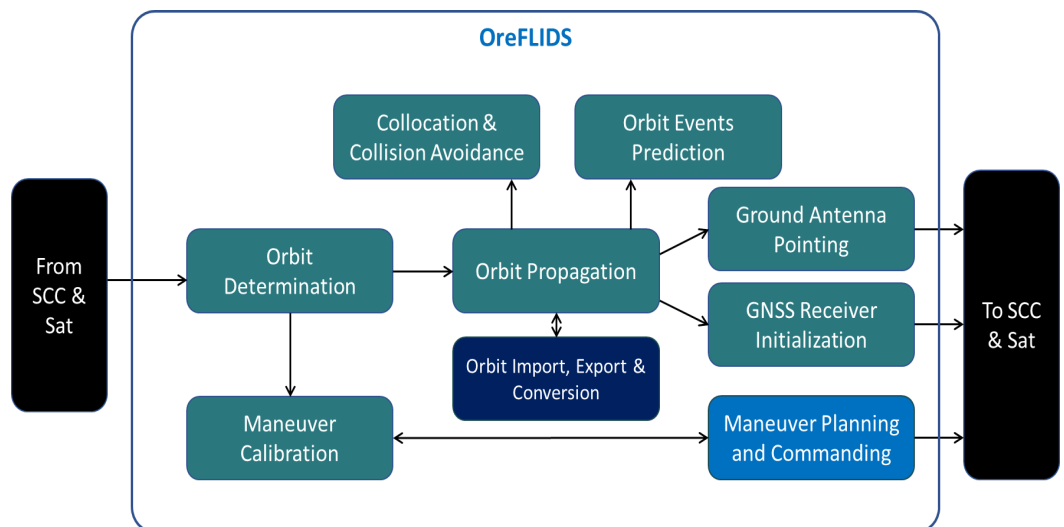
The market of **Telecommunication Satellites** with electrical and chemical propulsion is in full expansion, with new product lines being launched by the large integrators, as well as by ESA or CNES.

OreFLIDS is a Flight Dynamics System (FDS) developed by **CS GROUP** as Prime Contractor for the **NEOSAT programme**, part of **ESA's ARTES 14 programme**.

Implemented on a scalable architecture and based on **Orekit**, the open-source flight dynamics library, continually improved with new features by **CS GROUP** engineers, **OreFLIDS** offers **plugged-in FDS modules** for multi-satellite missions, like Orbit Determination, Orbit Propagation including maneuvers, Orbit Events Prediction, Ground Antenna Pointing, Collocation and Collision Avoidance, GNSS Receiver Initialization and Maneuver Calibration.

The **customizable** configuration allows the **integration of 3rd party FDS modules** from external providers, as well as seamless **interface** with various **Ground Segment** solutions for **Satellite Control Centers (SCC)**.

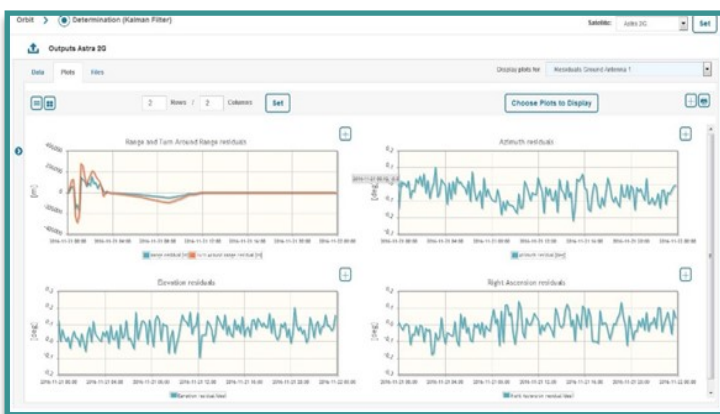
Other **features** include: automation of FDS operational activities via scheduled batch scripts, search and export of maneuvers' history, execution contexts and users management, administration of satellites, missions and stations configuration parameters, backup and redundancy.





KEY FEATURES OF OREFLIDS

- ✓ File import-export interface with **Ground Segment** solutions for **Satellite Control Center**
- ✓ **Single Page Web GUI** that allows internationalization and the display of output data, files and plots
- ✓ **Flight Dynamics Software modules** and **functions** implemented as **plugins** for **multi-satellite operations**:
 - **Orbit determination** based on antenna measurements (ranging, tracking and turn-around ranging), as well as GNSS measurements, including the implementation of real-time Kalman filters
 - **Orbit propagation** computation of orbit ephemeris using perturbations and maneuvers
 - **Orbit events prediction and detection** during orbit propagation (e.g. equator crossing time, box center latitude, longitude and altitude, maximum and minimum of latitude, longitude and altitude, eclipses of the Sun by Earth and Moon, transits of the Sun as seen by a ground station)
 - **Orbit import, conversion and export** functions, TLE generation
 - **Ground antenna pointing** ephemeris
 - **Collocation and survey** of managed satellites, supporting orbit propagation, involving planned maneuvers, internal and external satellites and bodies, collision avoidance warnings and antenna separation angles
 - **Maneuver calibration** of Hall effect thrusters (HET) performances using predicted and actual data
 - **GNSS Receiver Initialization**
- ✓ A rich **RESTful API** to control and manage all the FDS modules and services
- ✓ Dashboard for management of **scheduled batch scripts for automation** with dedicated language for creating scripts
- ✓ Search of **historical maneuvers** with export facilities
- ✓ Management of **working and reference contexts** of FDS executions, with possibility to be loaded and re-executed later for mission analysis
- ✓ **Users management**, various profiles (operator, expert, admin) and access types (private, public or profile level) to the data of the executed contexts



ABOUT CS ROMANIA

CS ROMANIA is an IT software services company, member of CS GROUP, with significant expertise in software development and maintenance for Mission Critical Systems and software applications in various domains such as Aeronautics, Space, Intelligent Transportation, Energy and Industry.



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