



plan4EO

mission planning

Multi-mission module that enables imagery acquisition and data downlink

**Payload and
flight dynamics
scenarios**

**Ground station
pass schedules**

**Dedicated
visualisation
interface**

**Automatic and
manual modes
supported**

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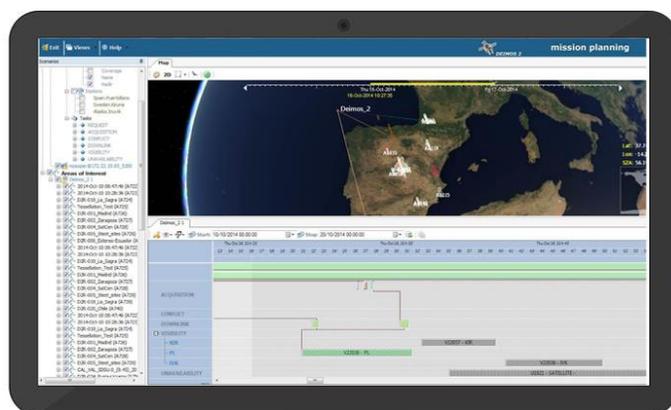
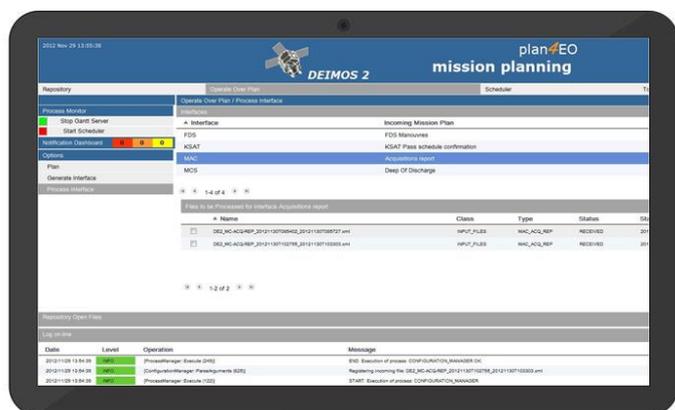
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plan4EO mission planning

plan4EO is a mission planning module that can be integrated with other gs4EO suite components, as well as with 3rd-party modules. This way, it offers **different deployment configurations** for the customisation of the ground segment according to the **customer's requirements**.

It is **working operationally** in **Sentinel-2 (A and B spacecraft)** and **Deimos-2 missions**, and provides satellite operators and planning brokers with the following capabilities:

- **Generation of the Instrument Payload Scenarios.** These plans contain the directives related to the attitude control operations as well as the planned imaging and downloading operations to be performed on-board the satellite. The plans are always **conflict-free** and **generated from the acquisition requests**, according to the predefined mission rules and constraints.
- **Generation of the ground station Pass Schedules (acquisition plans).** These schedules contain all the planned downlink operations at the corresponding ground stations and its associated data (e.g. orbit information).
- **Visualization of the plan through a dedicated interface** (Planning Exploitation Tool HMI, planET). The HMI includes a **Gantt chart**, a **World Map**, and a **Plot views** where the planning events included in the mission plan are displayed for a selected time period. **Relevant planning events** constituting the mission plan are: instrument operations, recording and downlink operations, areas or interest, station visibilities, and periods of unavailability. **Status of the spacecraft resources**, like battery and power, are also shown.
- An additional HMI (**Master Broker HMI**) handles the **different planning tasks** (planning process, generation of schedules, retrieval of new orbital information, etc.), allowing their execution in an **automatic mode**, through a configured agenda, or **manually** by the operators. The HMI displays the planned and executed tasks, together with their corresponding execution status.



Deimos Space ground segment systems are built using a combination of **4EO products** working in a coherent and synchronized way, although all of them can also be used as **independent applications**.

plan**4EO**
mission planning

archive**4EO**
archive & catalogue

fly**4EO**
flight dynamics

process**4EO**
image processing chain

control**4EO**
mission control system

monitor**4EO**
monitoring & control

track**4EO**
ground station

calval**4EO**
calibration & validation

user**4EO**
user services

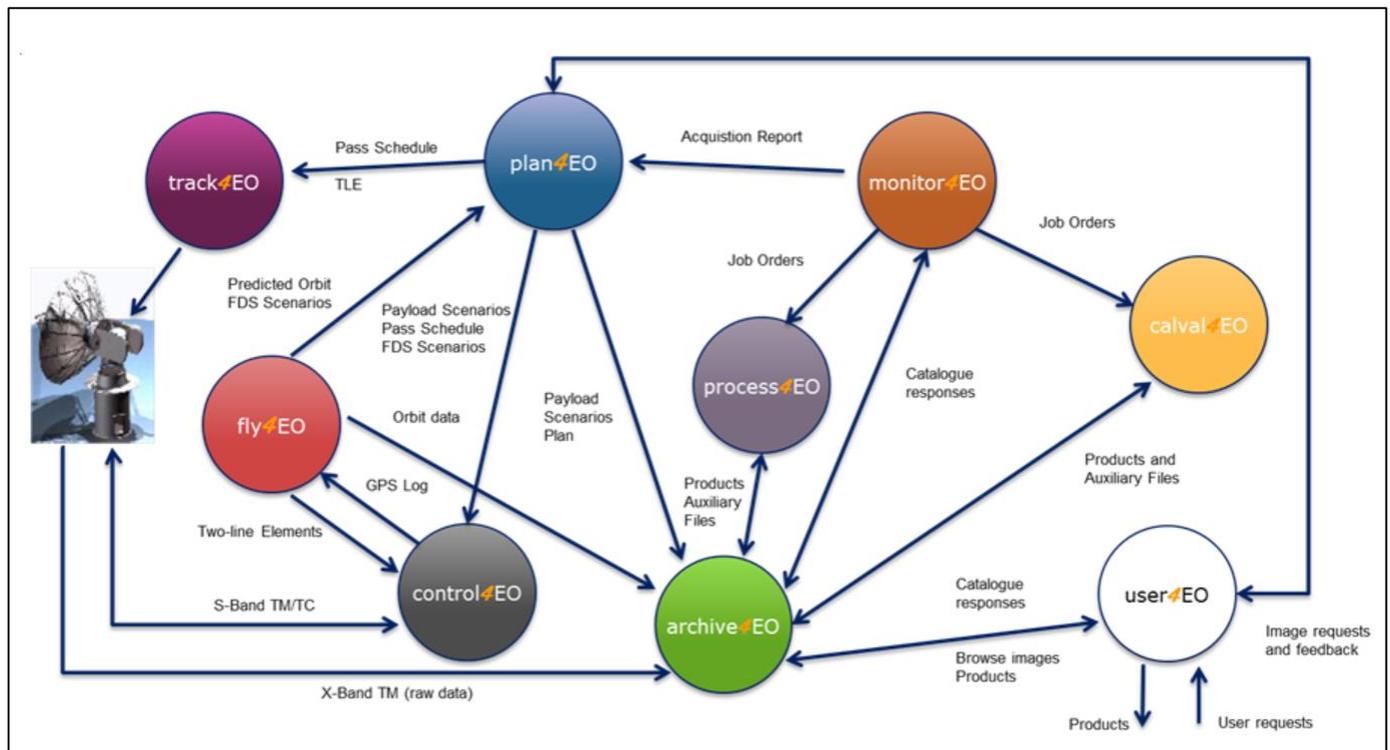
These products are already being used in different
ESA and Spanish Governmental missions.

Together they form **gs4EO**,
the **Ground Segment of DEIMOS-2.**

Thanks to its **modular design**, the **gs4EO** suite of ground segment products can be used to **customize the ground segment according to the customer's requirements**.

The various individual products can be assembled in different ways to implement different deployment configurations, **from a single product** supporting a specific mission need, **to a complete Ground Segment** or even a **Direct Receiving Station** that provides fast, direct and safe access to the mission data.

This modularity also provides extraordinary flexibility in order to accommodate **more than one Earth Observation mission within an individual** the ground segment.



The deployment shown above is the most typical set-up of all the Ground Segment elements, **providing all the ground segment capabilities required by the mission**.

With this solution, customers would mainly **access the spacecraft resources via the User Services, user4EO**, and all the data downlink and processing tasks would be performed in the single "central" ground segment (CGS).

Each application communicates with the remaining Ground Segment using file-based interfaces, easing its integration with other external solutions. The applications are controlled by means of **advanced user interfaces**, in many cases web-based, and **can be operated remotely**.

Many **gs4EO** components have **multi-mission capabilities** that allow the integration within the GS of third party missions. The archive component allows **the storage of data from different satellites** and the integration effort will depend on the specific interfaces of the third party missions.