



# plan4EO

## mission planning

Multi-mission module enabling 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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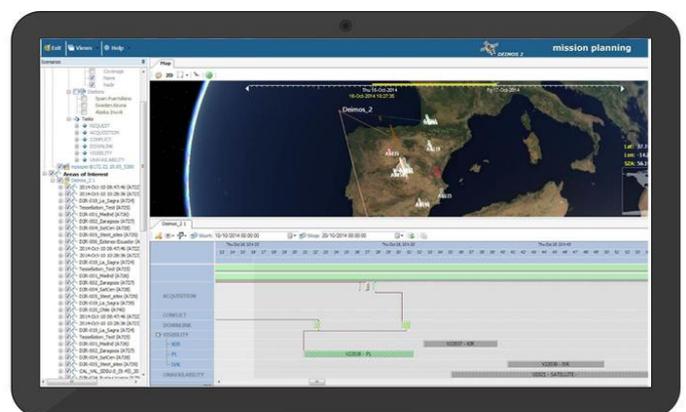
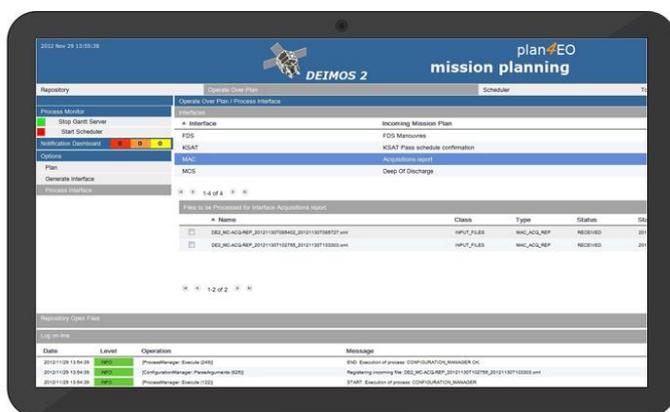
# plan4EO mission planning

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)**, **Deimos-2** and **AEOLUS** missions, and currently being configured to operate for **NAOS** and **BIOMASS** missions.

plan4EO 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 **gs4EO products** working in a coherent and synchronized way, although all of them can also be used as **independent systems**.

control4EO  
**mission control system**

archive4EO  
**archive & catalogue**

plan4EO  
**mission planning**

chain4EO  
**processing orchestration**

fly4EO  
**flight dynamics**

process4EO  
**image data processing**

track4EO  
**ground station control**

calval4EO  
**calibration & validation**

contact4EO  
**ground stations scheduling**

monitor4EO  
**monitoring & control**

auto4EO  
**operations automation**

user4EO  
**user services**

identity4EO  
**authentication & authorisation**

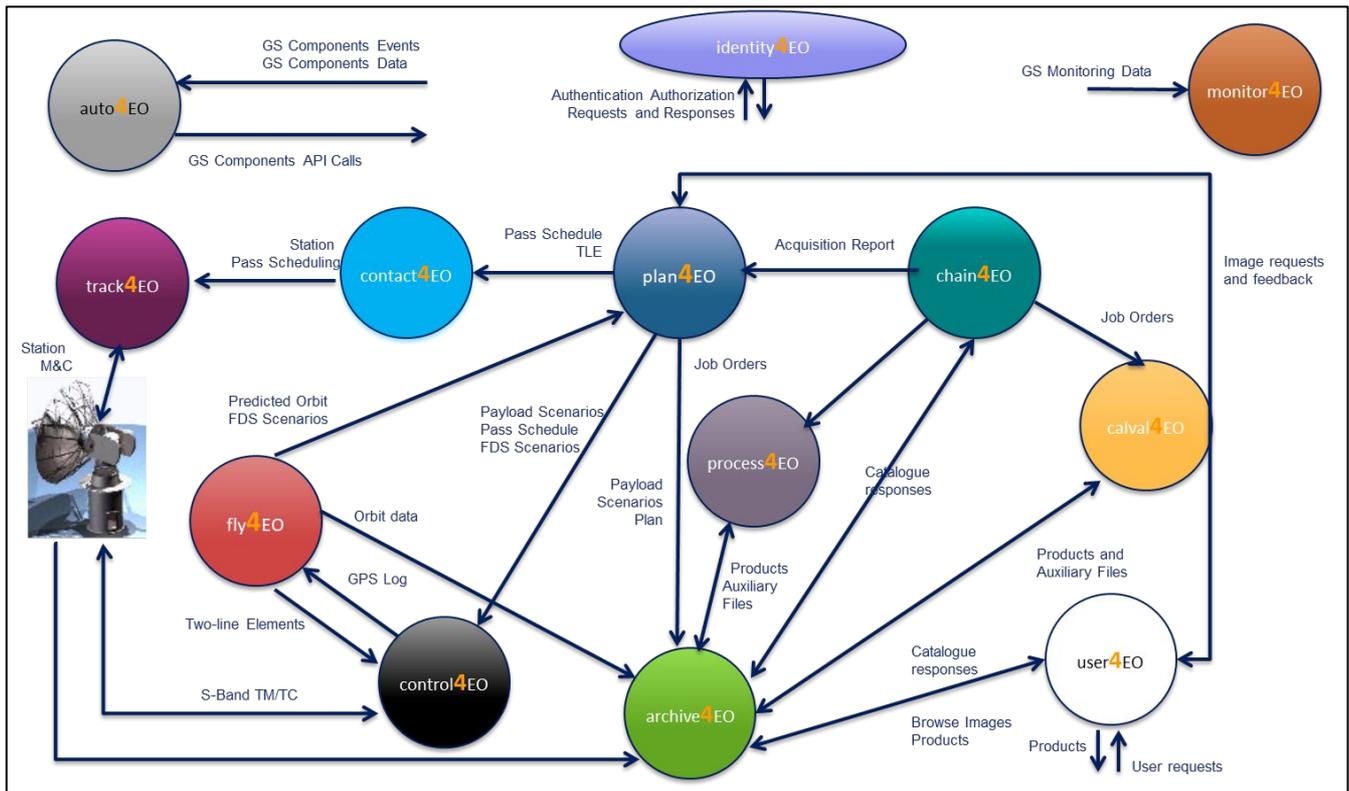
These products are already **being used in multiple Earth Observation Missions**, within complete GS setups, like **DEIMOS-1, DEIMOS-2, SAT4EO** or **NAOS**, or as standalone subsystems, as **plan4EO**, used by **Sentinel-2, AEOLUS** and **BIOMASS**, **archive4EO**, used in **PAZ, SEOSAT, CHEOPS** and **AWS**, **fly4EO**, used in **Amazônia-1, ...**

*All of them are the basis for **gs4EO**, your Ground Segment solution from DEIMOS*



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

The various individual products can be assembled in different ways to implement **different deployment configurations**, from a complete Ground Segment to a Direct Receiving Station or just a single subsystem supporting a specific mission need. This modularity and interoperability also provides extraordinary flexibility in order to accommodate **more than one Earth Observation mission** in the ground segment, with different levels of integration that can be offered.



The figure above outlines the most typical GS set-up using all **gs4EO** elements, providing full ground segment capabilities required by any EO mission. With this solution, customers would mainly access the S/C resources via the User Services, and all tasking, data downlink and processing would be performed autonomously by the remaining elements, ensuring complete user feedback throughout every step.

Each application communicates with the remaining Ground Segment through well defined interfaces, following open standards, easing its integration with other external solutions. All applications are controlled by means of **advanced user interfaces**, mainly web-based, that enable **remote operation** capabilities.

Moreover, all **gs4EO** components have **multi-mission capabilities** that allow their integration within the GS of third party missions. The archive component allows the storage of data from different satellites and follows well adopted standards to facilitate the integration process.

**gs4EO** solutions are cloud friendly allowing a variety of deployments, from customer's private infrastructure, to hybrid solutions or fully cloud based.