SAMIEdit

Quick Start Guide

Desktop

Issue: 1.5.0.0
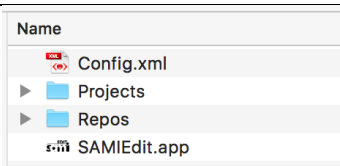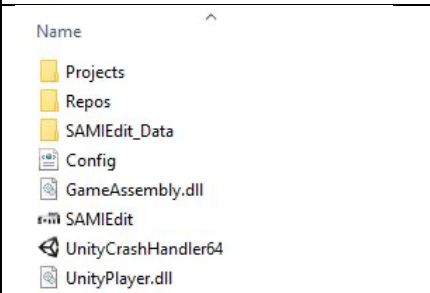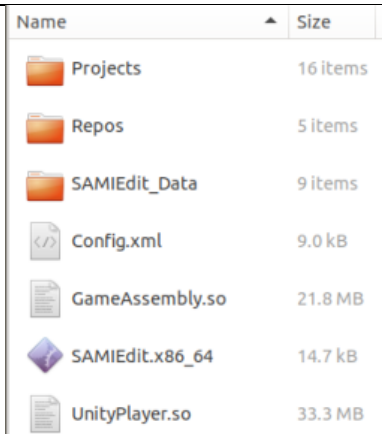
Date: 15/08/2024

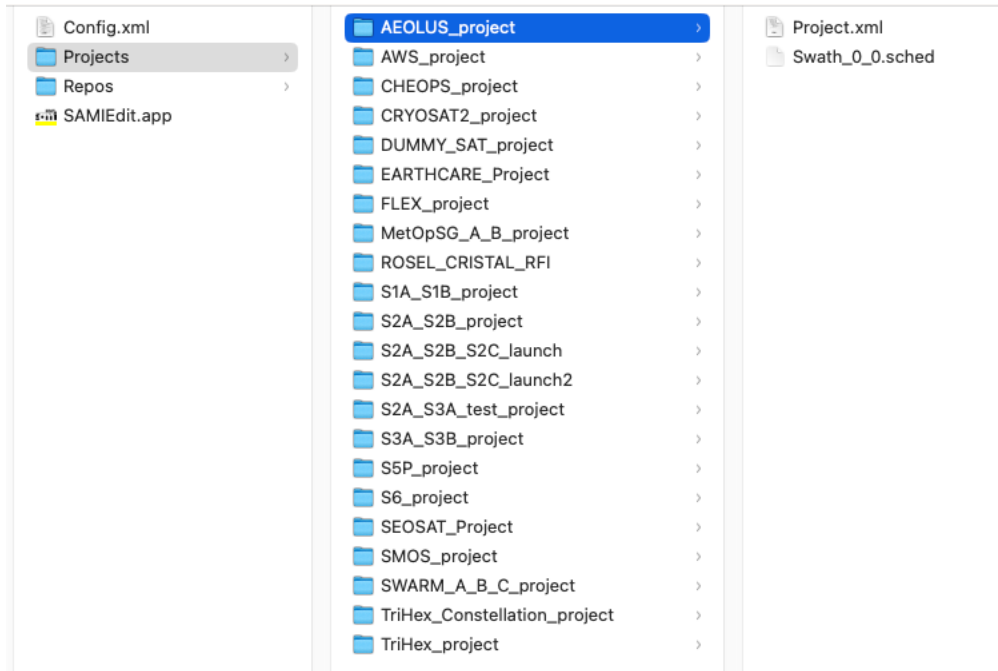Prepared by: M. Pinol Sole (ESA/ESTEC)

Getting Started

SAMIEdit for desktop is distributed as a .dmg file (for Mac OS X) and as a zipped package (for Windows 64-bit and Linux 64-bit).

- Mac OS X: in order to install the software, double-click the .dmg file to open it. A Finder window appears. Drag the application's icon into the destination folder (either the Applications folder or any other user folder).
- Windows: in order to install the software, copy the package in the destination folder and expand the package by double-clicking the .zip file.
- Linux: in order to install the software, copy the package in the destination folder and expand the package by double-clicking the .zip file.
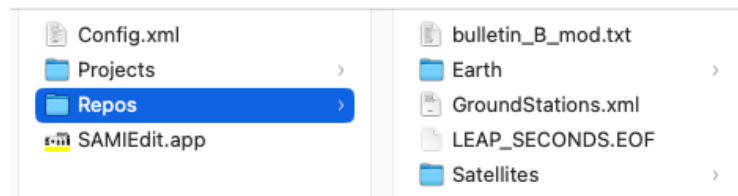
The SAMIEdit application files and the configuration files can be found at the top level of the application directory:

Mac OS X	Windows	Linux
Name Config.xml ▶ Projects ▶ Repos SAMIEdit.app	Name Projects Repos SAMIEdit_Data Config GameAssembly.dll SAMIEdit UnityCrashHandler64 UnityPlayer.dll	Name — Size Projects — 16 items Repos — 5 items SAMIEdit_Data — 9 items Config.xml — 9.0 kB GameAssembly.so — 21.8 MB SAMIEdit.x86_64 — 14.7 kB UnityPlayer.so — 33.3 MB

The Projects folder contains the list of available pre-defined Project files.

The Repos folder contains the available Earth textures as well as the Satellite mission files, grouped by mission name, including 3D satellite models and orbit, attitude and swath definition files.

To launch the application, double-click on the application file:

- Windows executable file: SAMIEdit.exe
- Mac OS X application file: SAMIEdit.app
- Linux executable file: SAMIEdit.x86_64

The SAMIEdit main application window is shown:

When mousing over the top part of the main application window, the application menu is revealed:

When mousing over the bottom part of the main application window, on top of the time bar, a rectangular area is shown:

This area can be expanded up/down (mouse right drag) to display the timeline editor. It can be observed that the main application window consists of a scene display area, a time control bar and a timeline editor panel:
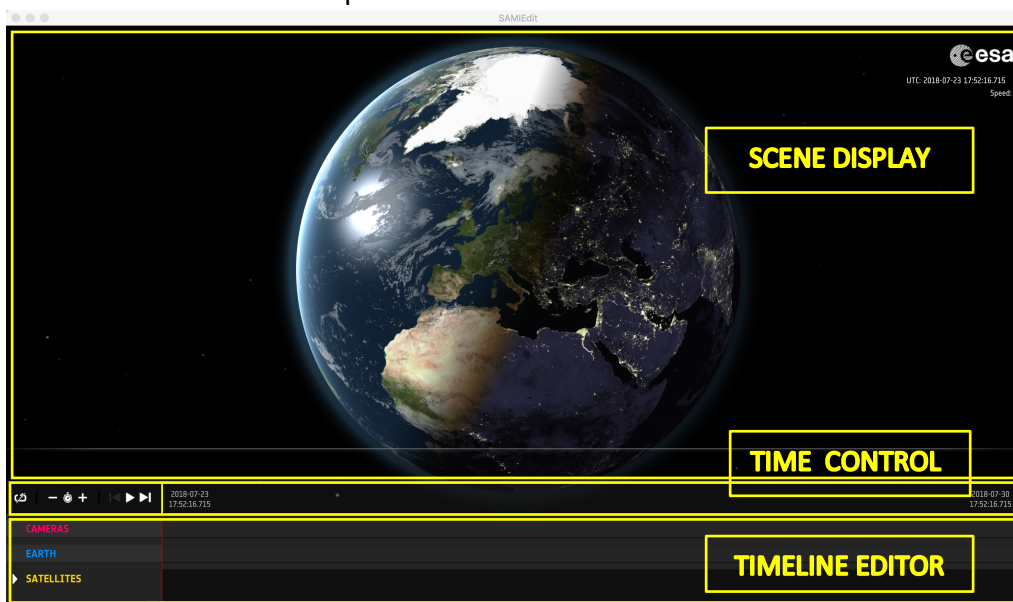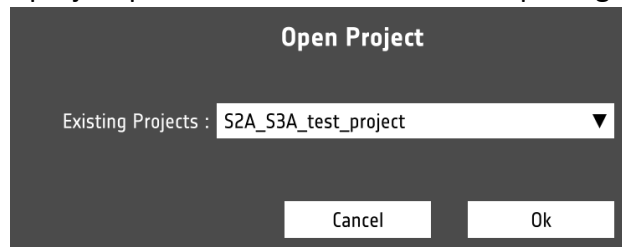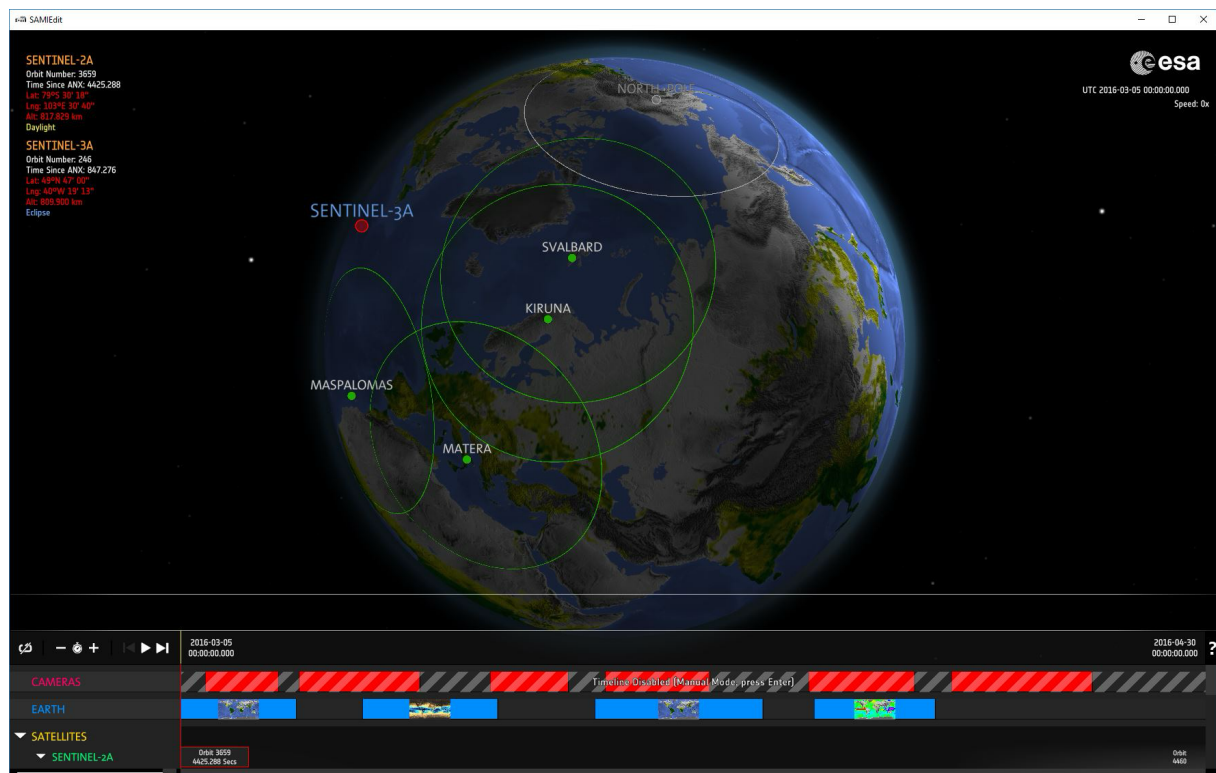
Opening example test project

In the application menu, select Project → Open

Select the example test project provided with the installation package:

After opening the test project, the main application window displays all the elements defined in the project:

Scene Display

The scene display area contains the Earth-satellite scene and text overlays showing the simulation UTC time and speed (top-right)

UTC: 2016-03-05 00:00:00

Speed: 0x

and information related to the satellites defined in the project (top-left), updated according to simulation UTC time:

SENTINEL-2A
Orbit Number: 3659
Time Since ANX: 4425.288
Lat: 79°S 30' 18"
Lng: 103°E 30' 40"
Alt: 817.829 km
Daylight
SENTINEL-3A
Orbit Number: 246
Time Since ANX: 847.276
Lat: 49°N 47' 00"
Lng: 40°W 19' 13"
Alt: 809.900 km
Eclipse

Time Control

The time control bar is split in two parts. The part of the left (green rectangle) contains the control buttons and the right-side part (blue rectangle) is the timeline where the yellow marker indicates the time in the scene. It is possible to jump in time by clicking on the timeline area. The control buttons allow the user to play/pause the simulation and increase/decrease the simulation speed.
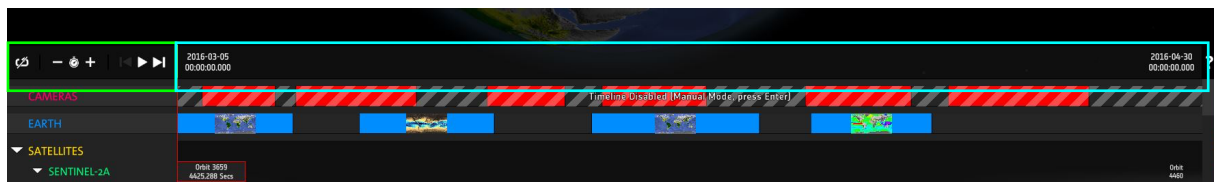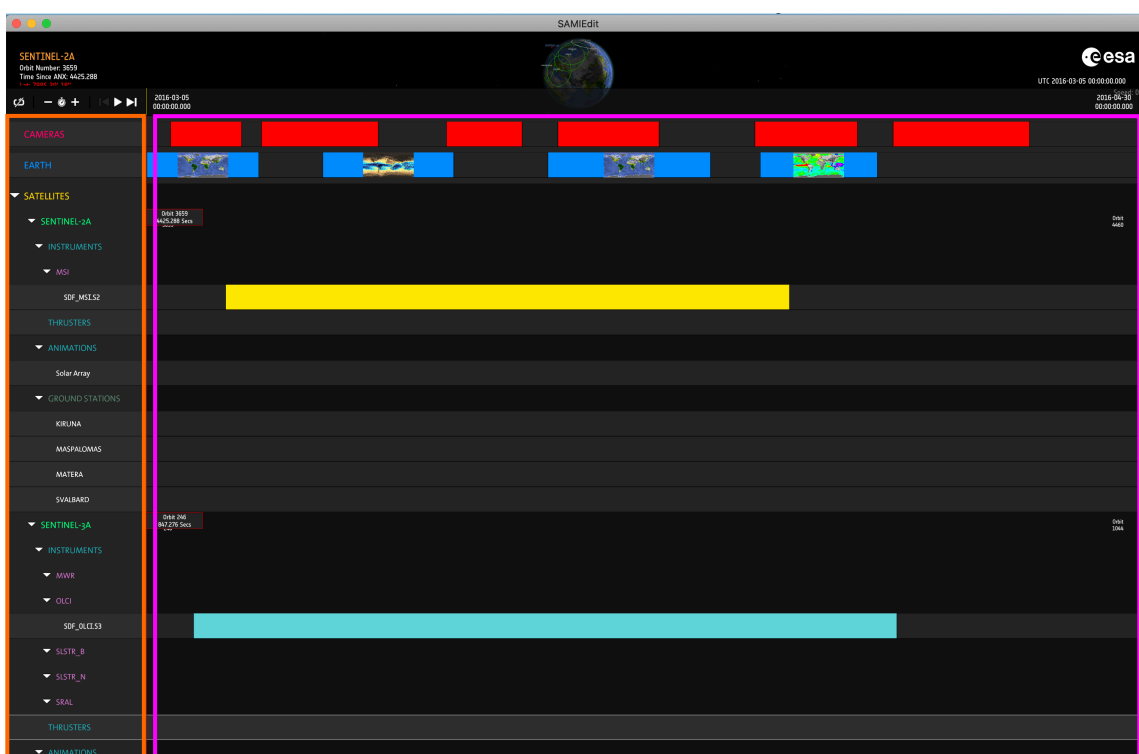
Timeline Editor

In the timeline editor, several time blocks have been inserted for the elements represented in the scene. Each of these blocks covers a time interval within the simulation time window. The project consists of the following elements:

- Satellite Sentinel-2A
    - MSI instrument swath: active
    - Ground Stations
        - Kiruna, Maspalomas, Matera, Svalbard: active
- Satellite Sentinel-3A
    - OLCI instrument swath: active
    - Ground Stations
        - Kiruna, Svalbard, Troll: active
        - North Pole: non-active

- Cameras: various camera modes. By default the camera timeline is disabled (Manual mode enabled).
- Earth: various Earth textures

Expanding the timeline editor (right-click and drag the area on top of the time control bar), the application window looks as follows:


Timeline Editor: Scene Elements Tree

The various scene elements are shown in the left-side item tree (orange rectangle). It is possible to interact with the elements in the tree by mouse right-click. Several actions are available, depending on the type of element:

- SATELLITES: Add Satellite, navigate list of existing satellites
- SATELLITE_NAME: Edit / Delete Satellite, navigate list of existing instruments
- INSTRUMENT_SWATH_NAME: Add Swath Configuration, navigate list of swath files
- SDF_INSTRUMENT_FILENAME: Edit / Delete Swath
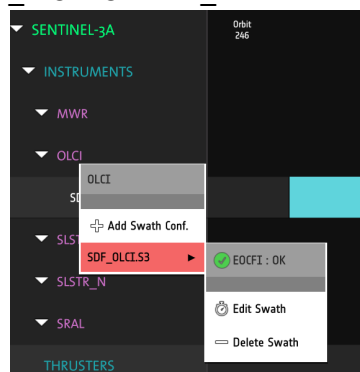- GROUND_STATION_NAME: Edit Colors

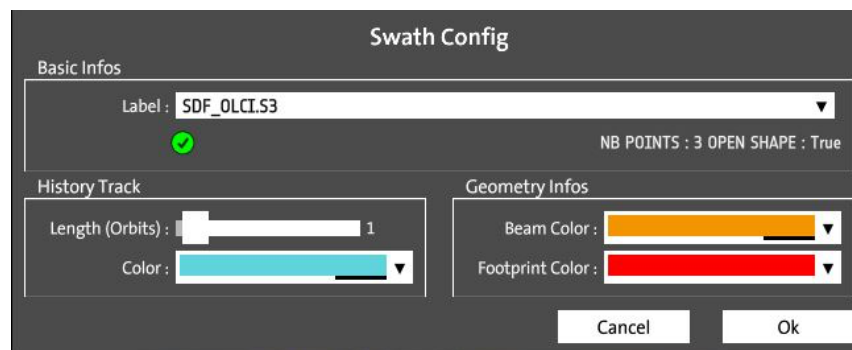Example of right-click on SATELLITE_NAME:
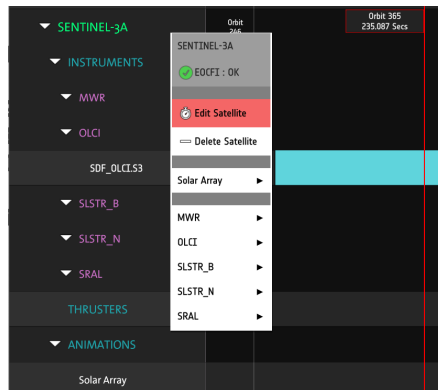
Selection of « Edit Satellite » triggers the following sequence of windows:
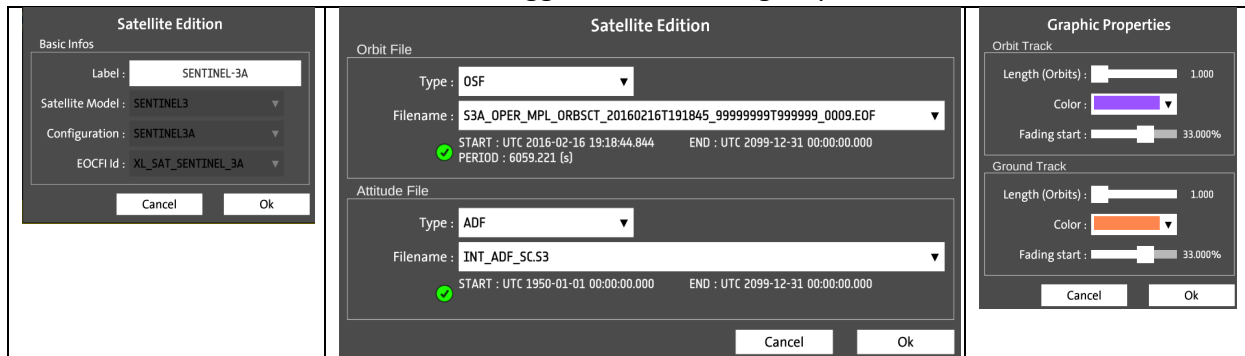
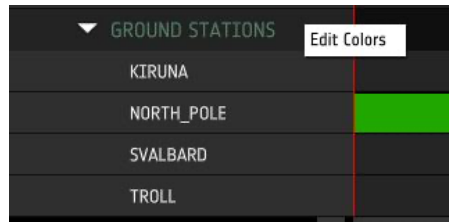Example of right-click on SDF_INSTRUMENT_FILENAME:

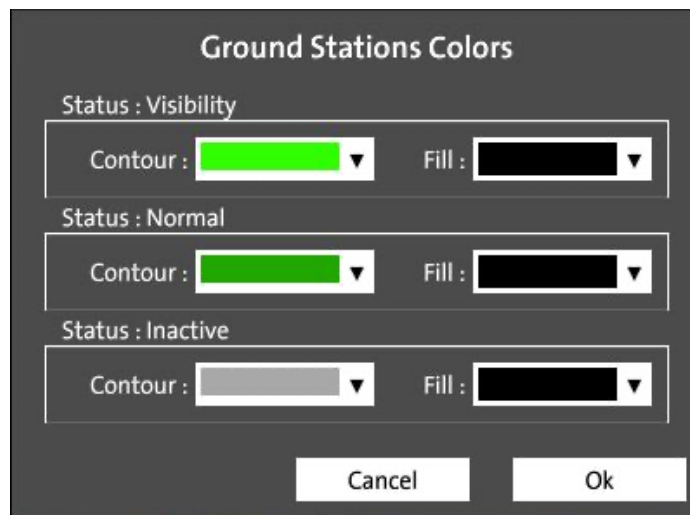Selection of « Edit Swath » » triggers the following window:

The list of pre-defined Swath Definition files (SDF_XXX.XX) that appears in the pull-down menu is taken from the contents of the mission folder "SDF".

Example of right-click on GROUND STATION_NAME:

Selection of « Ground Stations» or « Station Name» triggers the following window:

Timeline Editor: Time Blocks

In the right side of the timeline editor (screenshot in page 7, area marked with a pink rectangle), each row represents the timeline of an element in the scene.

- Mouse right drag (with left to right movement) allows to add time blocks for a given time span. When releasing the click, an editor window is shown in order to further edit the start/stop times of the new block.
- Mouse right-click on top of an existing block allows to edit/delete an existing block or clear the complete timeline
- Different types of block editor windows appear depending on the element associated to the block (Camera, Earth, Instrument Swath, Ground Station, Thrusters…)
  - Camera

    The Cameras timeline is disabled by default. It is possible to enable the camera time blocks by mouse right-click on top of an existing block and select Disable Manual Camera Mode (or through Application menu Cameras → Disable Manual Camera Mode)
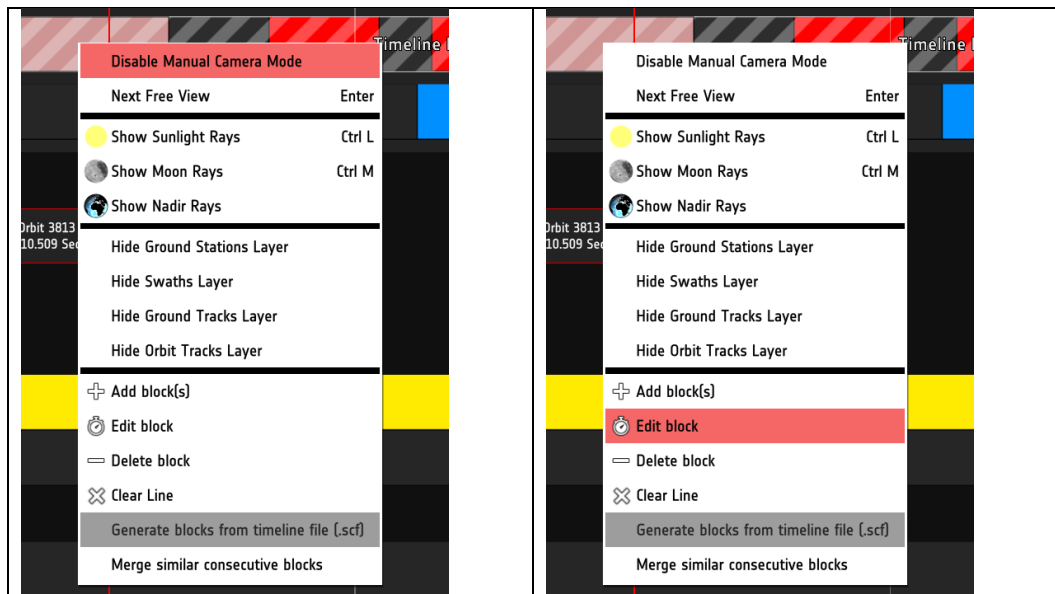
Time Block editor (step 1)

Copy and Paste buttons available for Start / Duration / Stop (buttons appear when mousing mouse over top right corner of the Start / Duration / Stop boxes). In addition, for Start/Stop subpanels, Go to Project Start and Go to Project Stop (resp.) icons are available to set the block duration to cover the complete project time window.

Timeline Activity

Start

Date : 2016-03-11

Time : 11:07:34.481

Duration

6 : 15 : 08 : 50 : 728

Or 572930.728 Secs

Stop

Date : 2016-03-18

Time : 02:16:25.209

☐ Repetition

1 block created

Step 1 of 2   Cancel   Ok

Time Block editor (step 2)

Camera Properties

Point of view

Type : Target ▼

Target : SENTINEL-3A ▼

Interactive : ☑

Graphic Details

Rays

Sun : ☐

Moon : ☐

Nadir : ☐

Layers

Ground Stations : ☑

Swaths : ☑

Ground Tracks : ☑

Orbit Tracks : ☑

Reset

Step 2 of 2   Cancel   Ok

o Earth Textures

o Instrument Swath

o Animations

o Ground Stations

Note: As opposite to the other timeline elements, for Ground Stations, the timeline blocks represent unavailability times (station non-active)

o Thrusters

Timeline Editor Element: Cameras

The Cameras timeline is enabled if the mode "Timeline" is enabled from the application menu or contextual block menus.

- If Cameras → Disable Manual Camera Mode is selected, it means that the camera view will be changing according to the configuration in each of the camera blocks included in the timeline
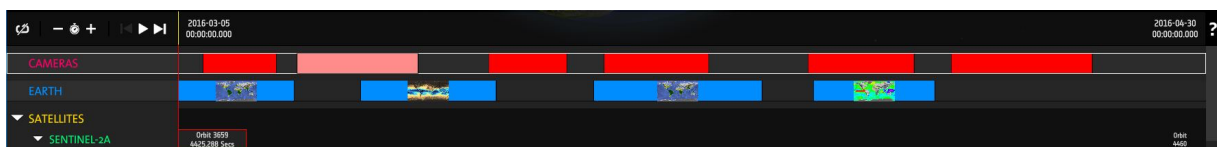
- If Cameras → Enable Manual Camera Mode is selected, the change in the camera view will be triggered manually by pressing 'Enter'. Then the camera view cycles from 3D Earth view, 2D Earth view and Satellite(s) based view. In this mode it is not possible to add camera time blocks in the Cameras timeline:
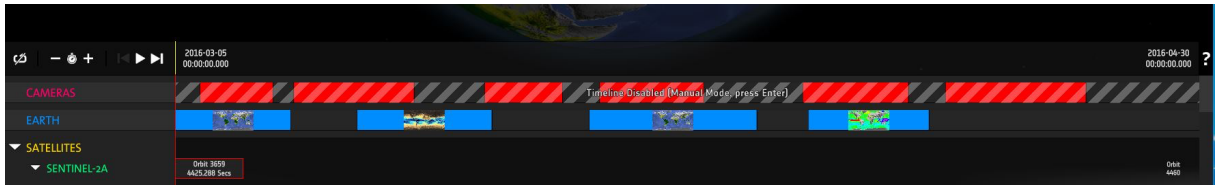
Three types of camera definitions are available:

- Target camera: The camera is attached to the target and can be moved around (mouse left drag). The target can be the Earth, a given satellite or a ground station.
  - o Target: Earth
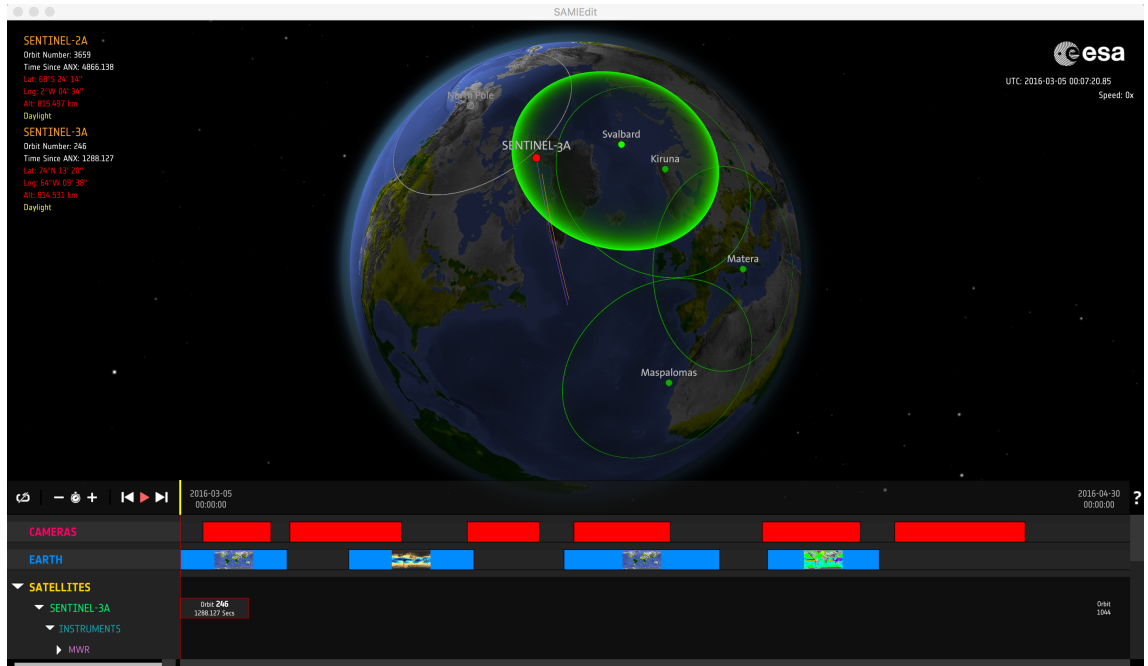
  - ✓ Allowed interaction
    - ▪ View Rotation: Mouse Left Drag
    - ▪ Zoom: Mouse Scroll or Mouse Right & Left Drag
    - ▪ View Pan: Mouse Right Drag
    - ▪ Enable / disable display of Sun/Moon/Nadir Rays
  - o Target: Sentinel-2A
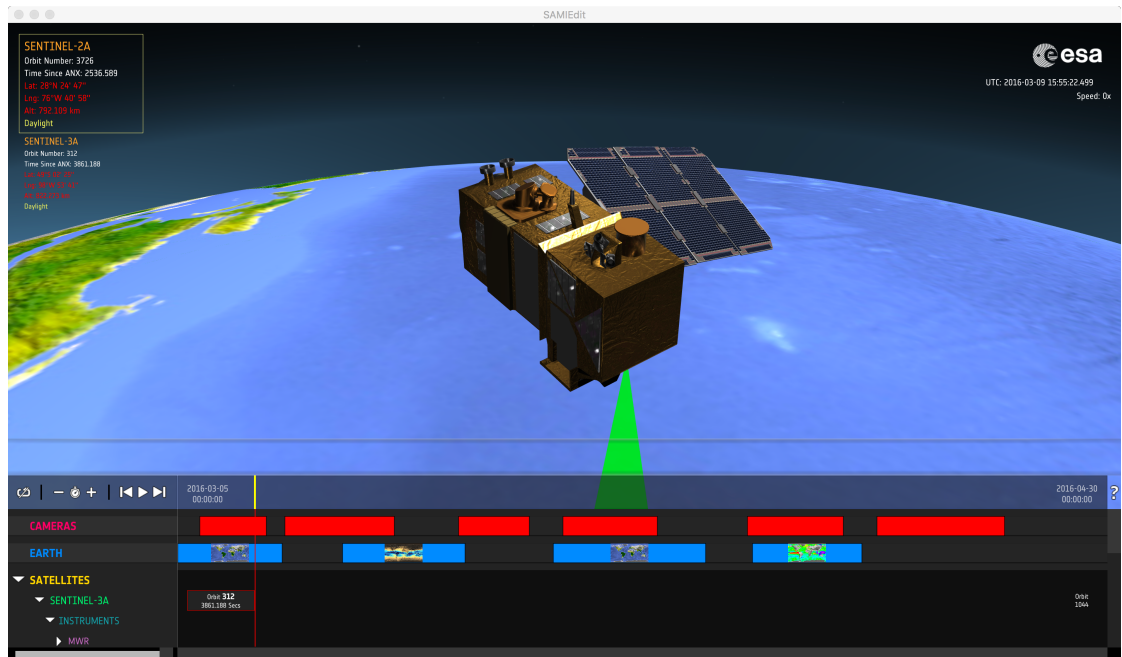
- ✓ Allowed interaction
    - View Rotation: Mouse Left Drag
    - Zoom: Mouse Scroll or Mouse Right & Left Drag
    - View Pan: Mouse Right Drag
    - Enable / disable display of Sun/Moon/Nadir Rays

- 2D Earth view camera: Rectangular projection map, fixed view

- Look Through camera: The camera looks through a given satellite, targeting the Earth, Moon, Sun, another satellite or a ground station.
    - Example: Look through Sentinel-2A, target Sun

✓ Allowed interaction
- Zoom: Mouse Scroll or Mouse Right & Left Drag
- View Pan: Mouse Right Drag
- Enable / disable display of Sun/Moon/Nadir Ray
- Invert looking direction
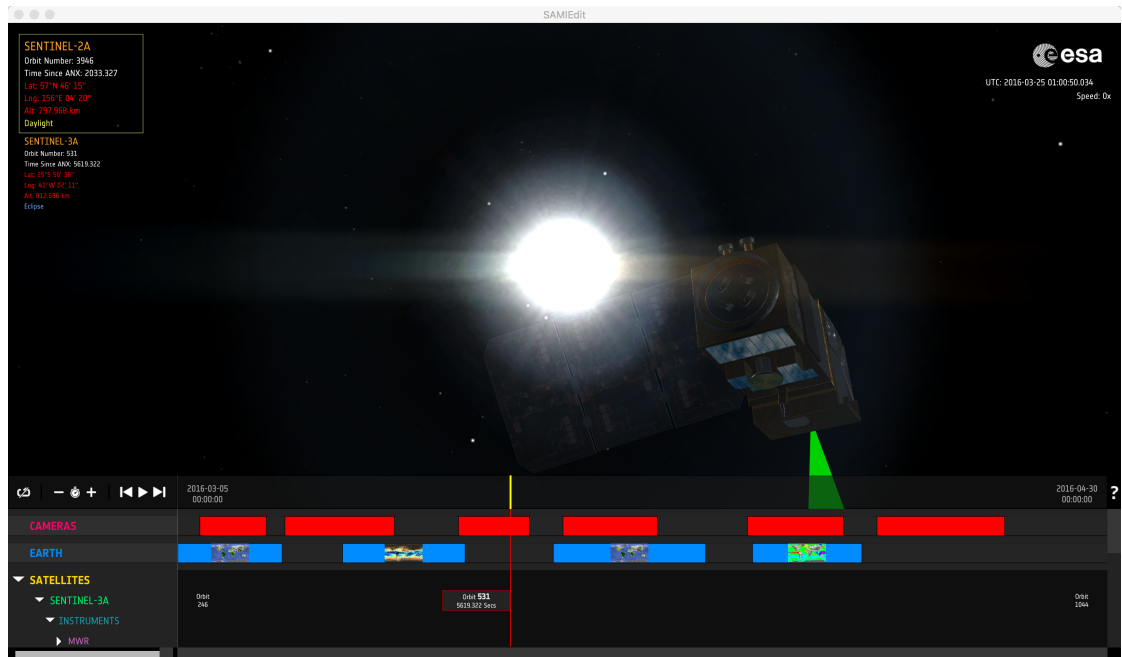
Time Block Repetition

It is possible to add a set of block with a given time repetition pattern. The example is for the Camera timeline, but it can be done for any timeline (Earth Textures, Swaths….)

- Step 1: Add block → Right-click on the timeline area and select Add Block(s)
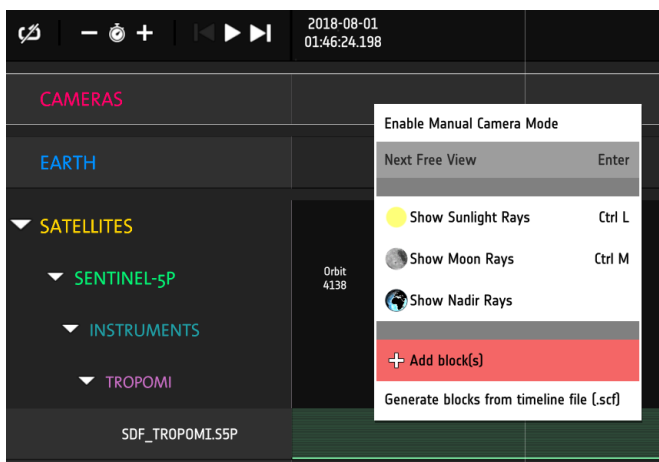
- Step 2a: Timeline Block Window opens

- Step 2b: Edit Block Start / Stop Times → Duration 10 minutes

- Step 2c: Tick the 'Repetition' checkbox → Set the offset between blocks to 20 minutes

- Step 3: Click Ok, set of repetition time blocks are added to the timeline. Select Camera type (Target-Sentinel-5P)
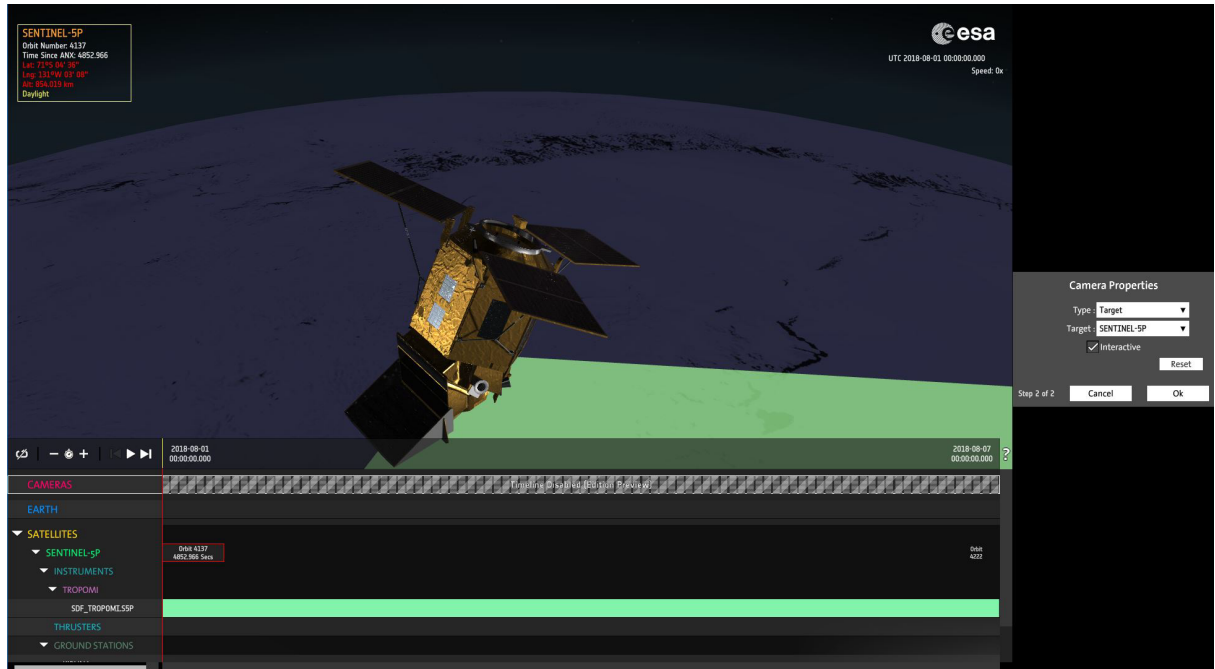
- Step 4: Add block → Right-click on the timeline area and select Add Block(s). Edit Block Start / Stop Times → Start Time after first block previously created, Duration 10 minutes. Set the offset between time blocks to 20 minutes.
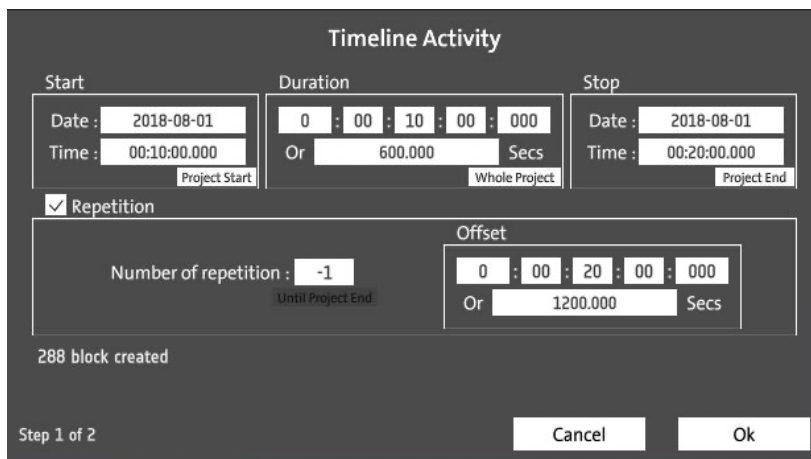
- Step 5 : Click Ok, set of repetition time blocks are added to the timeline. Select Camera type (2D)
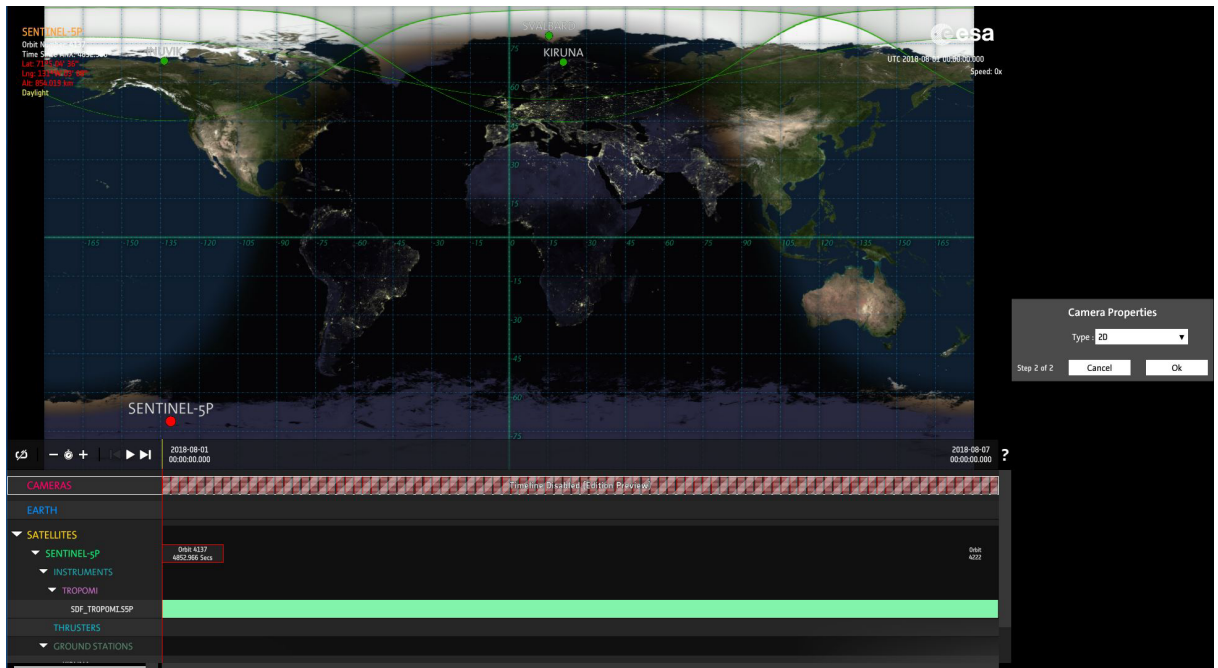
- Step 6 : Click Ok, set of time blocks are added to the timeline. When playing from start of the project time window, the camera view will change following the camera sequence set in the time blocks :
  - Camera Target – Sentinel-5p during 10 minutes
  - Camera 2D Earth during 10 minutes
  - Default camera (3D Earth view) during 10 minutes
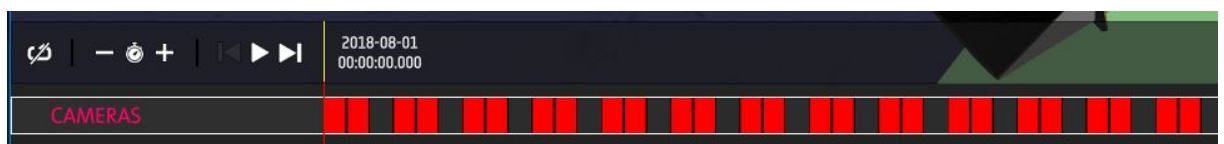
Import Timeline File (.SCF)

It is possible to import a timeline file (segments file export from Esov NG, extension .SCF) to generate a list of time blocks.

The example is for a swath instrument timeline, but it can be done for any timeline (Earth Textures, Cameras, Swaths, Ground Stations,….)

- Step 1a: Create folder "SCF" (if folder does not exist), inside the mission, e.g. "Repos/Satellites/SENTINEL2/SENTINEL2A/SCF/"
- Step 1b: Copy .scf file (in this example, MSI_AFRICA_SOUTH_AMERICA.scf) into the folder 'SCF'
- Step 2: On MSI swath timeline → Right-click on the timeline area and select Generate blocks from timeline file (.scf)
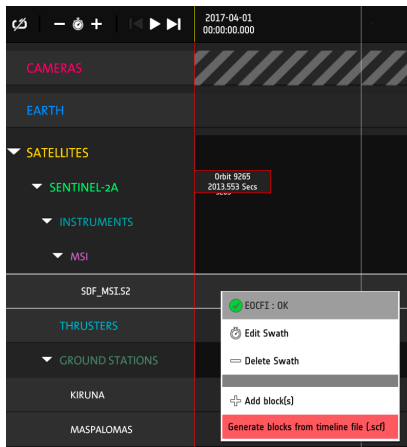
- Step 3: Timeline Block Window opens, select the .scf file
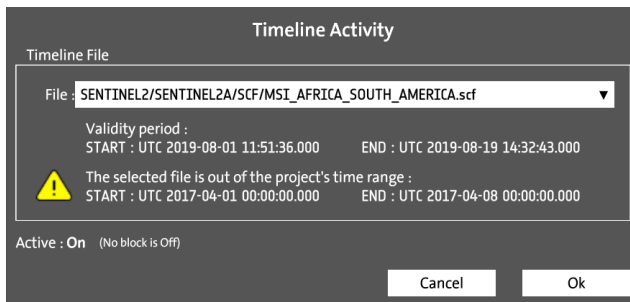
- Step 4: Timeline Block Window opens, select the .scf file and click Ok
- Step 5: Time Blocks are added to the swath timeline and the instrument swath is displayed when the simulation time runs over the time blocks
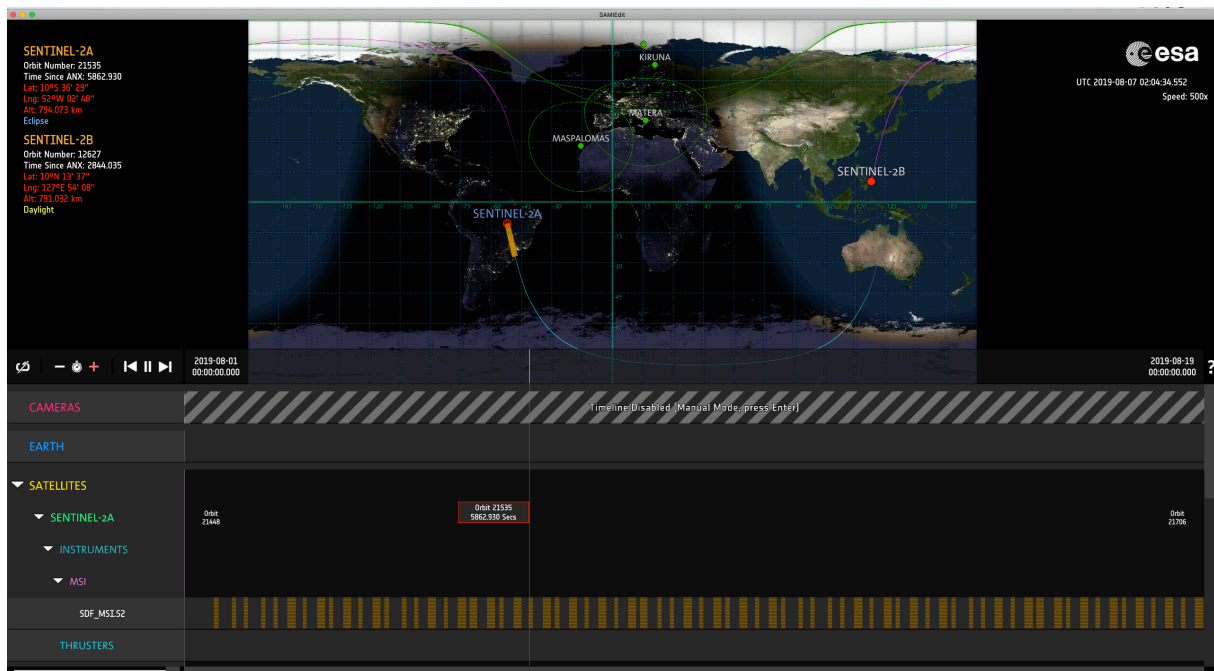
Sun, Moon and Nadir Ray Directions Overlay

With the option Cameras → Show Sunlight Rays it is possible to enable the display of a ray showing the direction from the satellite to the Sun. The sunlight ray becomes yellow if satellite is in daylight and blue if satellite is in eclipse.
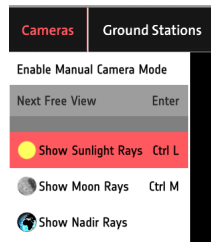
With the option Cameras → Show Moon Rays it is possible to enable the display of a ray showing the direction from the satellite to the Moon. The Moon ray becomes is displayed in red.
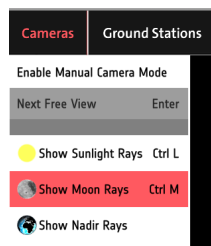
With the option Cameras → Show Nadir Rays it is possible to enable the display of a ray showing the direction from the satellite to the Earth center. The Nadir ray becomes is displayed in green.

The Sunlight, Moon direction and Nadir direction rays are displayed in all camera types except 2D Earth view camera.
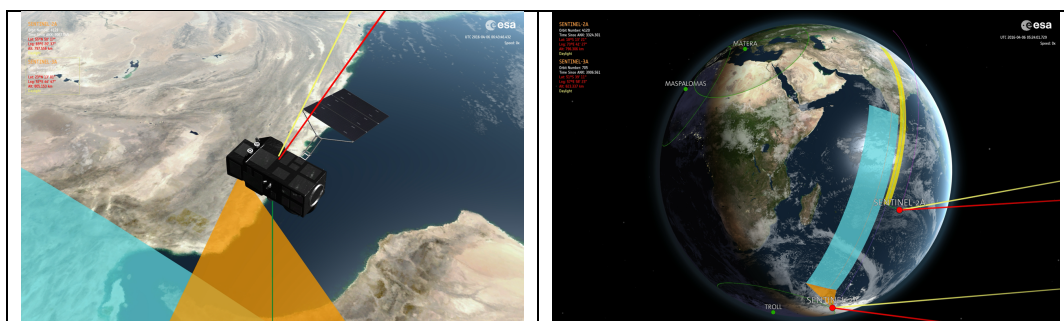
Deployment of Solar Arrays and Antennas

The solar arrays and deployable antennas appear as 'Deployed' by default. In the Satellites menu we can see the list of satellite elements that can be deployed and the actions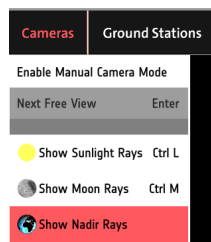 that can be applied after enabling the manual mode. The same menu can also be accessed by right-click on the satellite model.
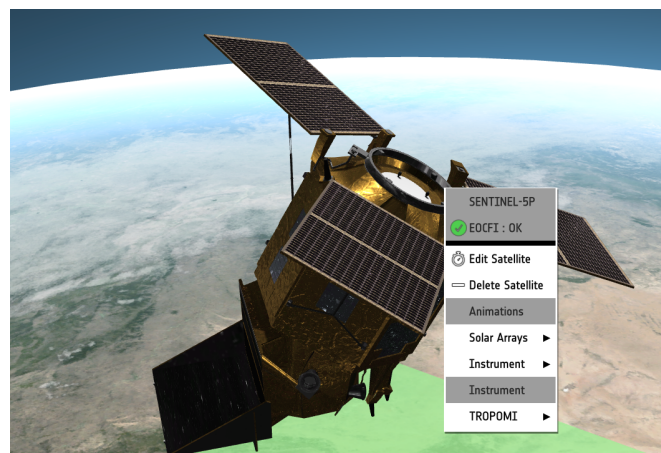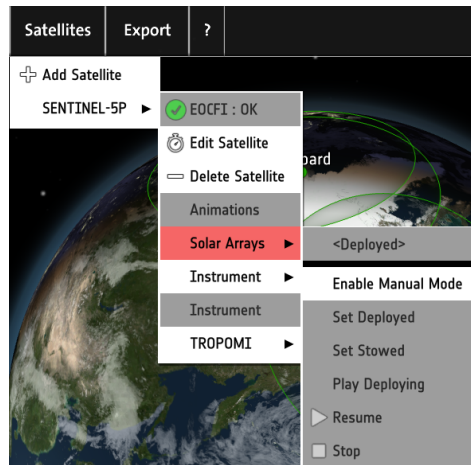
The possible States are Deployed, Deploying, Stowed. E.g. to show the relevant satellite elements in stowed position, it is necessary to select the satellite part (e.g. solar array) and select the option 'Enable Manual Mode' → Set Stowed. The deployment animation can then be triggered by selecting 'Play Deploying'.

The list can also be accessed through the ANIMATIONS timeline element. The timeline can be used to add time blocks to schedule the deployment sequences.
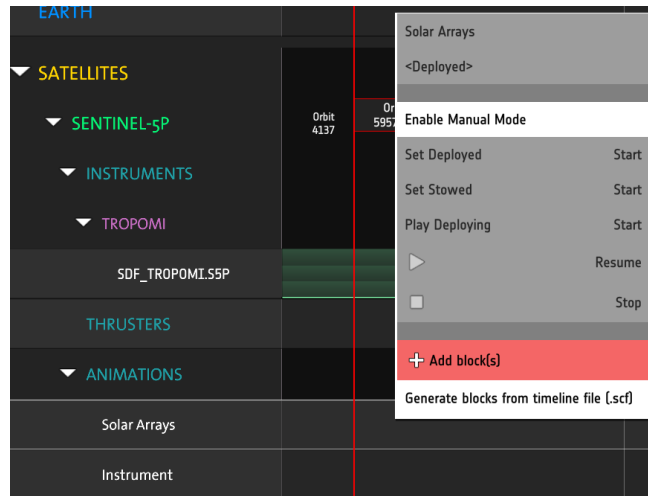
For Sentinel-2A/B and Sentinel-3A/B, EarthCARE and MetOp-SG-A/B, the solar array is rotating. The following Sun Tracking methods are available:

- Continuous →Solar Array rotates continuously, always oriented towards Sun
- Continuous (Forecast eclipse end) → Solar Array rotates continuously during Sun visibility and rewinds with given speed during eclipse to be Sun oriented when exiting eclipse
- None: a fixed solar array angle can be set
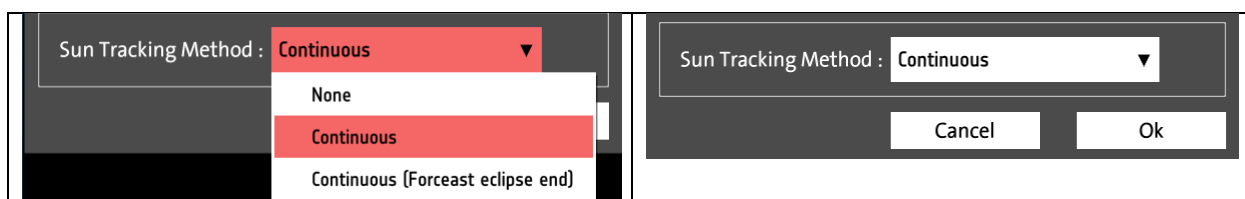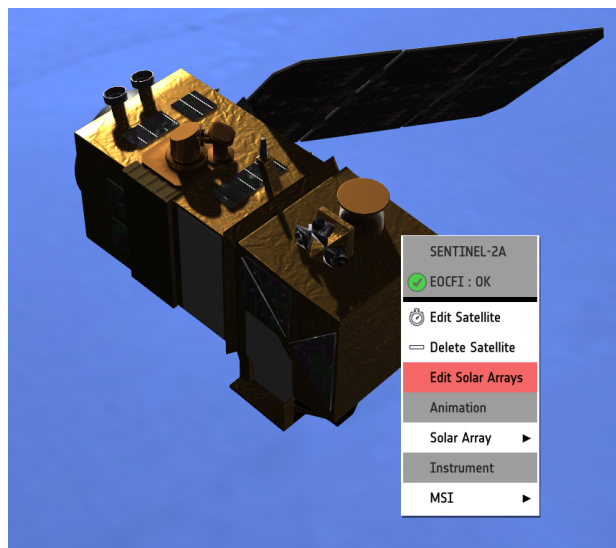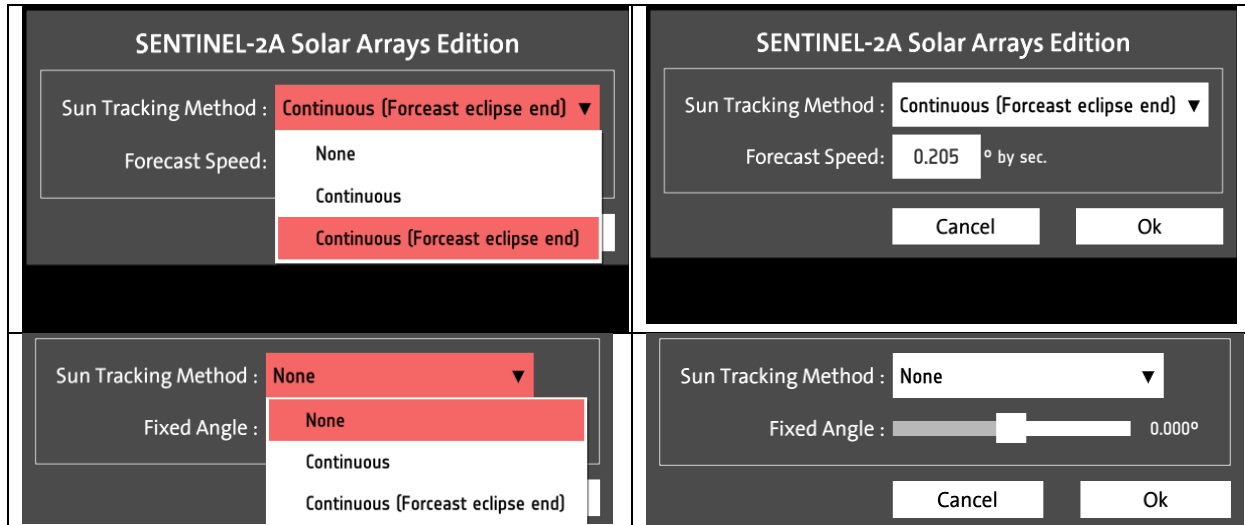
The solar array rotation needs to be disabled (i.e. set to 'None') before launching the application for a correct display of the stowing/deploying animation.

Satellite elements that can be deployed:

- Solar arrays for Aeolus, EarthCARE, FLEX, SMOS, Sentinel-1A/B, Sentinel-2A/B, Sentinel-3A/B, Sentinel-5P, Sentinel-6, MetOp-SG-A/B, Seosat, AWS
- Antenna arms for SMOS
- Radiator cover for Sentinel-5P
- CPR antenna dish for EarthCARE
- Antenna boom for Swarm A/B/C
- Telescope cover for CHEOPS
- SCA arms for MetOp-SG-B
- MWS instrument scanning for AWS

User Interface Description

The application menu appears when mousing over the top part of the scene display area.
The application menu items are described below.
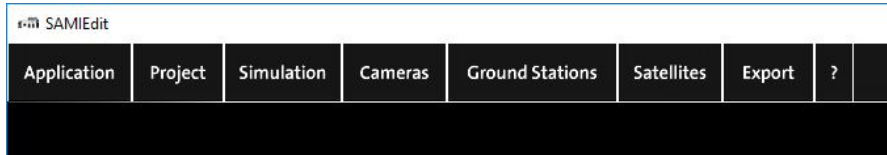
Application
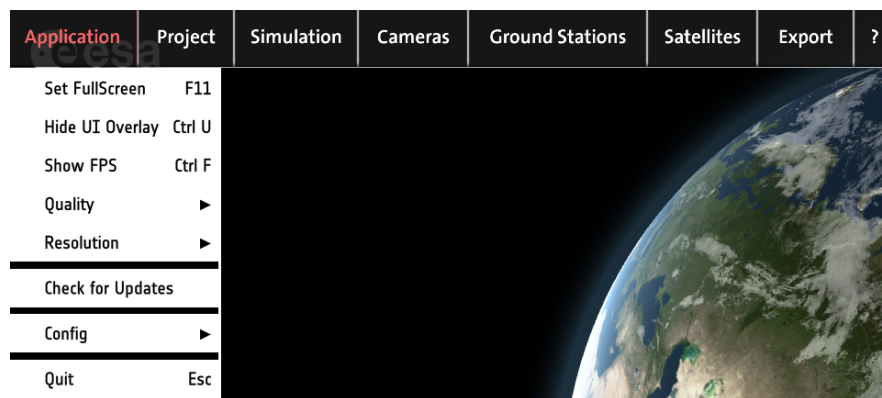
- Set Full Screen → Enable/disable full screen mode
- Hide UI Overlay → Show/hide text overlay with satellite related information and UTC time
- Show FPS → Show/hide text overlay with number of frames per second
- Quality →Default: Fantastic. Choice of Fastest/Fast/Simple/Good/Beatiful/Fantastic
- Resolution → List of available screen resolutions based on available screen (e.g. 1920 x 1080 full HD)
- Check for Updates → Triggers the version check for application and mission files
- Config → Options: Set Startup Project (select default project to be set at start up) and Reset config file (if edits performed to configuration file config.xml, reset to default settings)
- Quit → Exit the application

Project

- New → Create a new project

- Open → Select and opens an existing project
- Save → Save (overwrites) an existing project
- Save As → Save a project with a new name
- Edit Project Time Range → Trigger an editor window to set the start and stop UTC time of the simulation time window
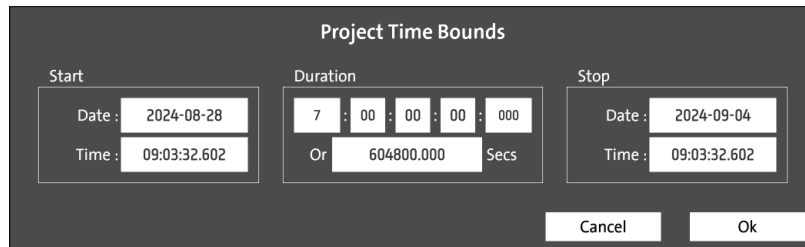
Copy and Paste buttons available for Start / Duration / Stop (buttons appear when mousing mouse over top right corner of the Start / Duration / Stop boxes)
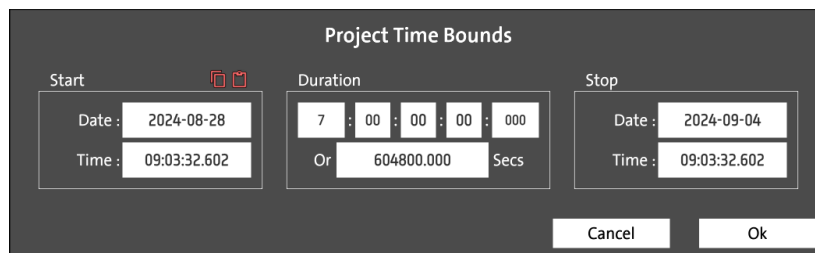
Simulation
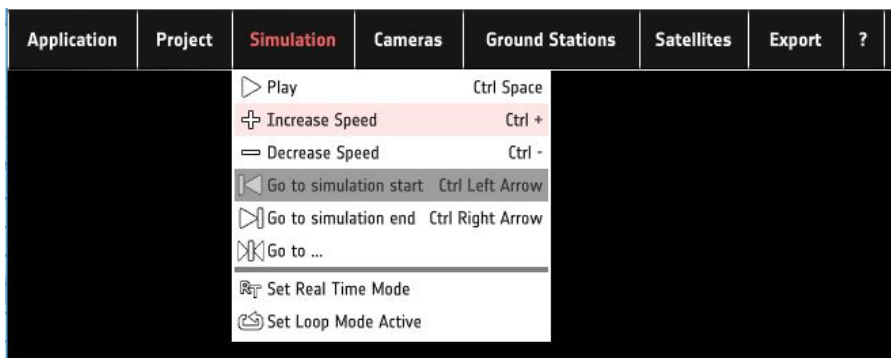
- Play/Pause → Play/Pause the simulation
- Increase Speed → Increase the simulation speed. Selected speed is shown as text overlay on the top-right side of the scene display (under the UTC time)
- Decrease Speed → Decrease the simulation speed. Selected speed is shown as text overlay on the top-right side of the scene display (under the UTC time)
- Go to simulation start → Set the simulation time to the beginning of the project time window

- Go to simulation end → Set the simulation time to the end of the project time window
- Go To… → Set the simulation time to an user specific time, selected by the user
- Set Simulation / Real Time Mode → Set the time mode to 'Simulation' or 'Real-Time'.
  - Simulation mode: project time window does not need to contain the current UTC time. It is possible to jump in the timeline and increase/decrease simulation speed
    When this mode is enabled, the following actions are available in the time control buttons:

    - Enable/disable « Endless Loop » mode: if enabled, the simulation starts over once the end time of the project time window is reached
    - Decrease/Increase simulation speed
    - Go to begin of project time window
    - Play/Pause simulation
    - Go to end of project time window

  - Real-time mode: project time window needs to contain the current UTC time. The simulation time is synchronized with current UTC time.
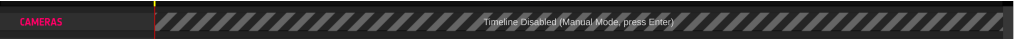   When this mode is enabled, the following actions are available in the time control buttons:


    - Play/Pause simulation

Cameras
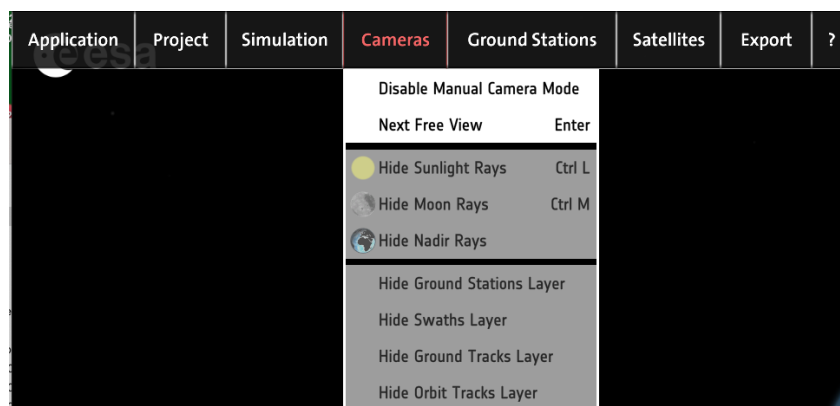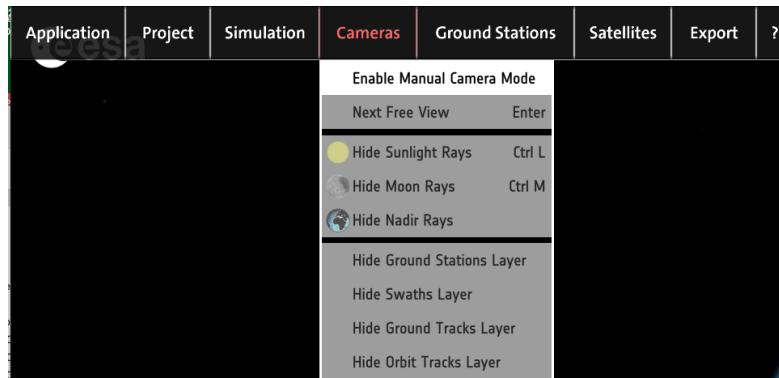
- Enable / Disable Manual Camera Mode → Set the camera mode to 'Manual' or 'Timeline.
    - Manual mode: change in the camera view will be triggered manually by pressing 'Enter'. Then the camera view cycles from 3D Earth view, 2D Earth view and Satellite(s) based view (Next Free View). In this mode it is not possible to add camera time blocks in the Cameras timeline:

    - Timeline mode: the camera view will be changing according to the configuration in each of the camera blocks included in the timeline

- Show/Hide Sunlight Rays → Enable/disable the display of a ray showing the direction from the satellite to the Sun. The ray becomes yellow if satellite is in daylight and blue if satellite is in eclipse. A satellite needs to be added to the project for this feature to work.
- Show/Hide Moon Rays → Enable/disable the display of a ray showing the direction from the satellite to the Moon. A satellite needs to be added to the project for this feature to work.
- Show/Hide Nadir Rays → Enable/disable the display of a ray showing the direction from the satellite to the center of the Earth. A satellite needs to be added to the project for this feature to work.
- Show/Hide Ground Station Layer → Enable/disable the display of the ground station visibility perimeter. A satellite needs to be added to the project for this feature to work.
- Show/Hide Swath Layer → Enable/disable the display of the instrument swaths. A satellite needs to be added to the project for this feature to work.
- Show/Hide Ground Tracks Layer → Enable/disable the display of the satellite ground-track. A satellite needs to be added to the project for this feature to work.
- Show/Hide Orbit Tracks Layer → Enable/disable the display of the satellite orbit track. A satellite needs to be added to the project for this feature to work.

Ground Stations

- Edit Colors → Triggers an editor window to set the colors indicating the possible ground station states
    - o Visibility: Ground Station is active and the satellite passes over the ground station
    - o Normal: Ground Station is active but the satellite does not pass over the ground station
    - o Inactive: Ground Station is non-active, visibility area displayed in the scene but not highlighted when the satellite passes over the ground station
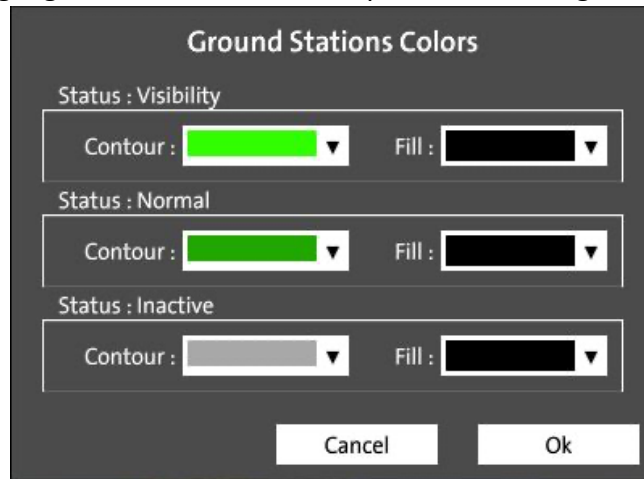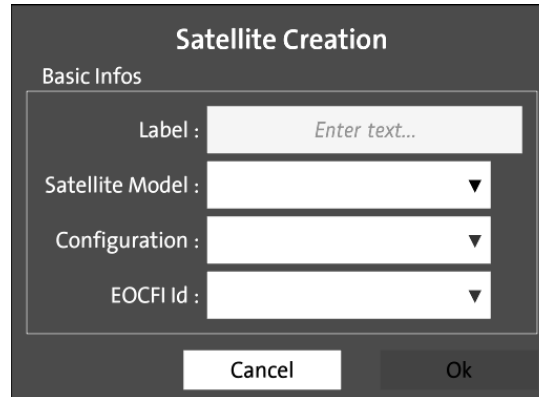
Satellites
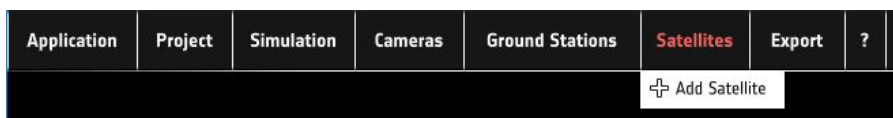
- Note that if the satellites have been already added to the project, the menu allows to navigate through all the satellite elements
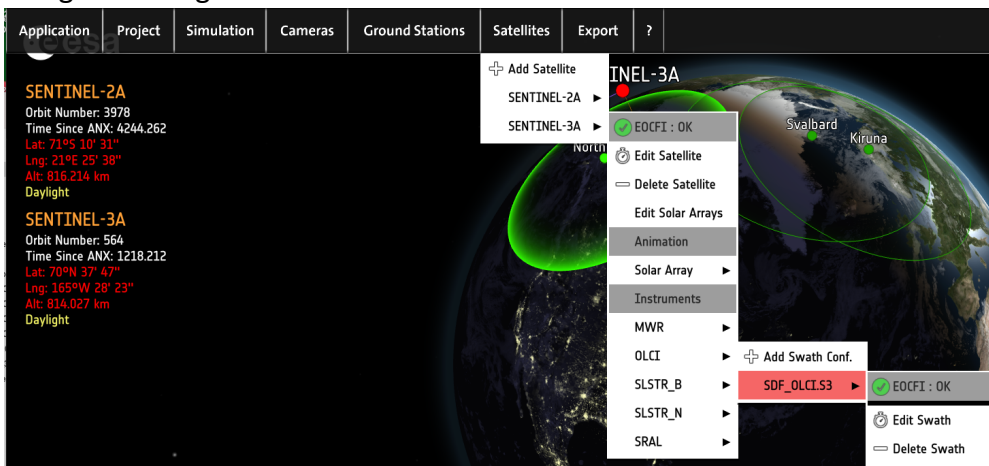
- Add Satellite → Triggers a selection window to edit the satellite label and select the 3D satellite model.
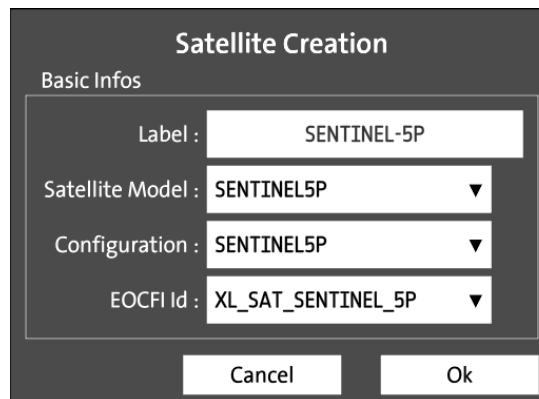
- Once the Satellite Model is selected, the Configuration and EOCFI Id menu are pre-filled with default values
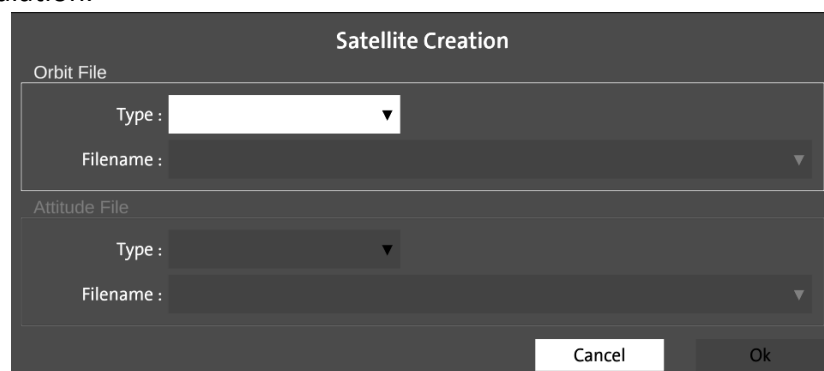
- After clicking Ok, a new panel appears to select the orbit and attitude files to be used in the simulation.
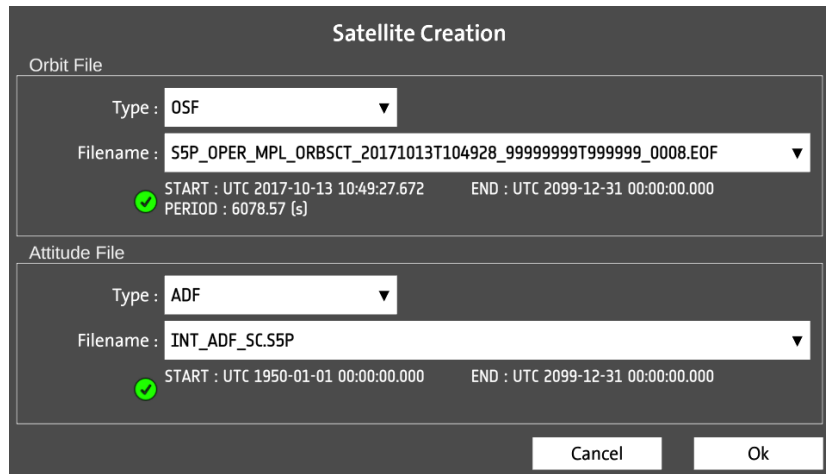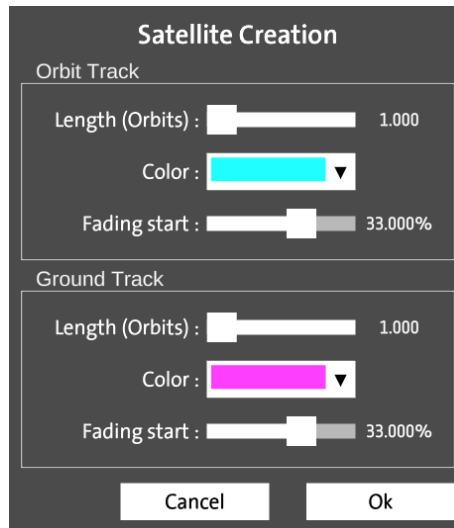
- The color and track length of the satellite orbit track and ground-track can be set in the next panel

- Type of Orbit File:
    - OSF: Orbit Scenario File (ORBSCT)
    - POF: Predicted or Restituted Orbit File (ORBPRE, ORBRES, ORBLPR)
    - TLE: Two-Line Element (only for TLEs from CELESTRAK website, with mission name EARTHCARE, CRYOSAT 2, SMOS, SWARM A/B/C, SENTINEL-1A, SENTINEL-1B, SENTINEL-2A, SENTINEL-2B, SENTINEL-3A, SENTINEL-3B, SENTINEL-5P). See Note in Section "About TLE orbit files" about how to use TLE files for other missions.
- Type of Attitude File:
    - ADF: Attitude Definition File (theoretical definition of attitude law)
    - ATT: Generic Attitude File (Euler angles or quaternions with respect UTC time)
        - Default orbit and attitude files are provided together with the application. See below the contents of a mission configuration folder (e.g. for SENTINEL1)

- Description of orbit and attitude files can be found in EO Mission Software File Format Specification
https://eop-cfi.esa.int/Repo/PUBLIC/DOCUMENTATION/SYSTEM_SUPPORT_DOCS/PE-ID-ESA-GS-584-EO_Mission_SW_File_Format_Specs_latest.pdf
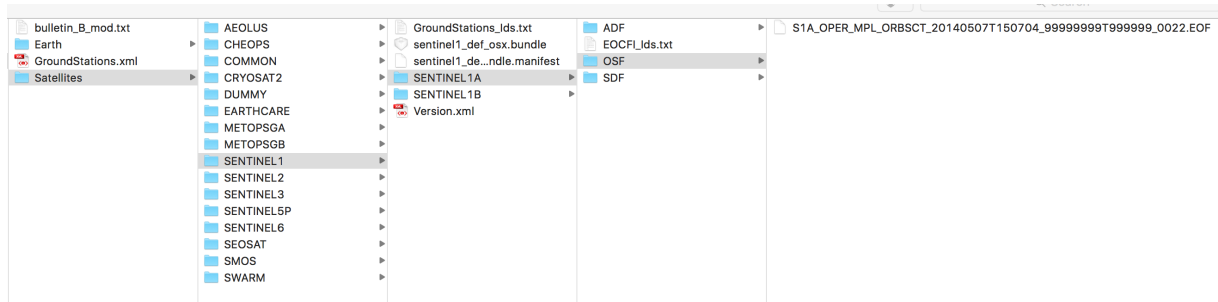
Export

- Image → Capture image snapshots of the scene display area. It triggers a window to select the resolution of the output image (within a set of predefined resolutions). The format of the exported image is JPEG.
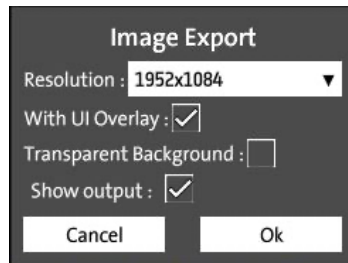
- Movie → Record a movie of the scene display area. It triggers a window to select the resolution and quality of the output movie (predefined movie resolutions and qualities). The format of the exported movie is MP4.
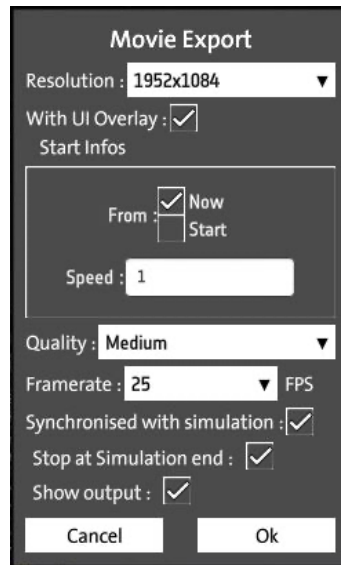
- Image Sequence → Capture a sequence of image snapshots of the scene display area. It triggers a window to select the resolution of the output image (within a set of predefined resolutions). The format of the exported images is JPEG.
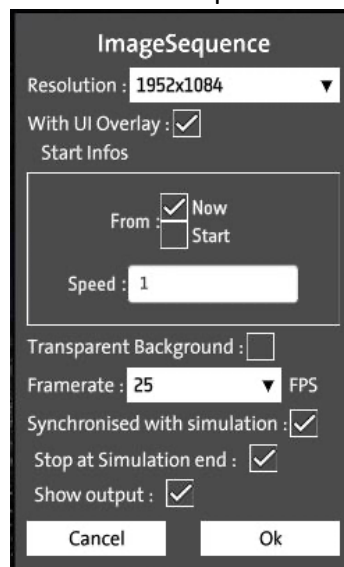
- A 'Finder' (Mac OS X) or 'File Explorer' (Windows) window opens with the exported image(s) or movie. The default output folders (see Config.xml) are:
    - Mac OS X:
      /Users/username/Cosium LAB/SAMIEdit /images
       /Users/username/Cosium LAB/SAMIEdit /movies
      /Users/username/Cosium LAB/SAMIEdit /sequences

    - Windows:
      C:\Users\username\ Cosium LAB\SAMIEdit\images
      C:\Users\username\ \Cosium LAB\SAMIEdit\movies
      C:\Users\username\ \Cosium LAB\SAMIEdit\sequences

Help (?)

Display an information window with the list of available shortcuts and third-party library versions.

Shortcuts	
Esc	: Quit
Ctrl Q	: Quit
Ctrl N	: New project
Ctrl O	: Open project
Ctrl S	: Save project
Ctrl Shift S	: Save project As
Ctrl F	: Toggle FPS
Ctrl H	: Toggle help
Ctrl U	: Toggle UI Overlay
Ctrl L	: Toggle Sunlight Rays
Ctrl M	: Toggle Moon Rays
Ctrl Space	: Play/Pause simulation
Ctrl +	: Decrease simulation speed
Ctrl -	: Increase simulation speed
Ctrl Left Arrow	: Go to simulation start
Ctrl Right Arrow	: Go to simulation end
Enter	: Change point of view
Mouse Left Drag	: Rotate point of view
Mouse Scroll	: Zoom point of view
Mouse Right & Left Drag	: Zoom point of view
Mouse Right Drag	: Pan point of view
(Over satellite) Mouse Dbl Click	: Animate satellite
Ctrl I	: Export image

About

EDIT sami
v1.5.0.0

made by

cosium
LAB

with Unity2022.3.40f1

☐ Show FPS

EOCFI

Current Earth Explorer CFI libraries :
----
explorer_file_handling version = 4.27
explorer_data_handling version = 4.27
explorer_lib version = 4.27
explorer_orbit version = 4.27
explorer_pointing version = 4.27
explorer_visibility version = 4.27

No Error

Advanced Settings

Manual default settings through the Config.xml file

The file 'Config.xml' is located in the application installation folder. The following default application settings can be modified through the configuration file :

Note: see comments in configuration file

- Automatically load a specific project on startup, play it or not at the chosen time mode, record it as a movie, at a chosen resolution and simulation speed
- Set the default Camera mode (Manual or Timeline)
- Specify the default ground stations colors for new projects
- Set the ground station mask minimum elevation angle (default value: 5.0 degrees)
- Tune the sizes and colors of the ground stations and satellites points of interest in the 2D and 3D views
- Set up the default style (width and colors) of the Sun/Moon direction rays
- Tune the average brightness of the satellite model during sunlight and eclipse (reflection factors)
- Prevent EOCFI SW error messages to popup on screen
- Load only 3D View with a subset of the shortcuts
- Change the location and the names of the "Repos" and "Projects" folders
- Enable / disable the solar array rotation (only applies to Sentinel-2, Sentinel-3, EarthCARE and MetOp-SG-A/B)
- Specify the default location for the export folders (image and movies)

Thrusters Sequence files

An example of thruster file is given at 'Repos/Satellites/SMOS/THRUSTERS_SEQ/TestSMOSSeq.seq'.

The file format includes a header that can be adjusted to fit to any character separated values (Field 'SEPARATOR') generated by table-based software. As it is about active or inactive states of each of the identified satellite thrusters through the duration of a given scenario, only the value of an active state (Field 'STATE_ON') is needed. Any other value means inactive state.

The delta time is the time in seconds elapsed since the start of the project time window.

Satellite Ground Stations List file

In the 'Repos' folder there is the list of supported ground stations ('GroundStations.xml'). Each satellite declares the stations it uses from this list through the 'GroundStations_Ids.txt' file that can be located at the satellite model level and/or at the mission configuration level.

EOCFI Identifiers file

The satellites declare their EOCFI identifiers using files named 'EOCFI_Ids.txt' that can be stored at the model level and/or at the mission configuration level.

Adding User-Defined Missions

Using the DUMMY Satellite

The Dummy satellite is provided in order to support satellite missions other than the default ones provided with the application. The DUMMY 3D model is not representative of any mission, but the DUMMY folder structure makes possible to configure and display the satellite orbit and instrument swaths.
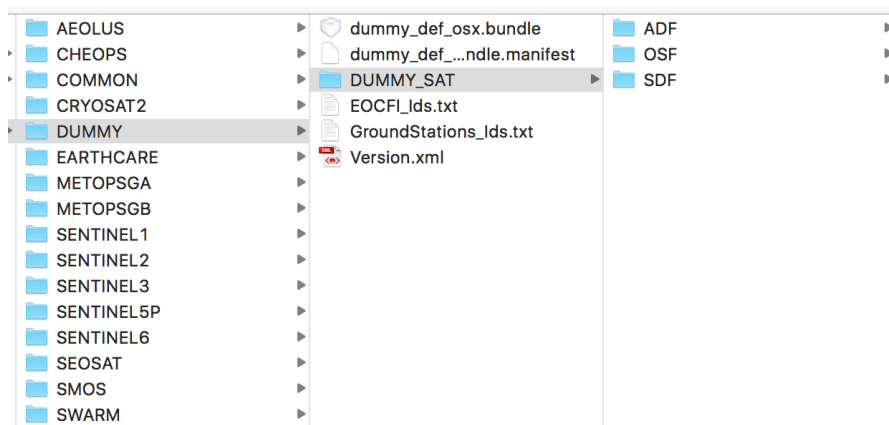
Configuration Steps

Steps to to configure additional missions:

1) Create a mission folder in './Repos/Satellites/DUMMY/' with the name of your mission, e..g. MY_SATELLITE.
Inside the "MY_SATELLITE" folder, you need to have, at least:

- an "ADF" or "ATT" folder, depending on the type of attitude info available, as already explained in section "Satellites". If the "ATT" folder does not exist and a generic Attitude file needs to be used, it needs to be created by the user
- an "OSF", "POF" or "TLE" folder, depending on the type of input orbit file available, as already explained in section "Satellites". If the "POF" or "TLE" fold er do not exist and a TLE or POF file needs to be used, the dedicated folder needs to be created by the user
- a "SDF" folder. This folder contains the list of pre-defined Swath Definition files. This folder is not required if only the satellite /orbit ground-track is going to be displayed.
- a "SCF" folder. This folder contains the list of Swath Timeline files. This folder is not required unless SCFs with time blocks need be detected.
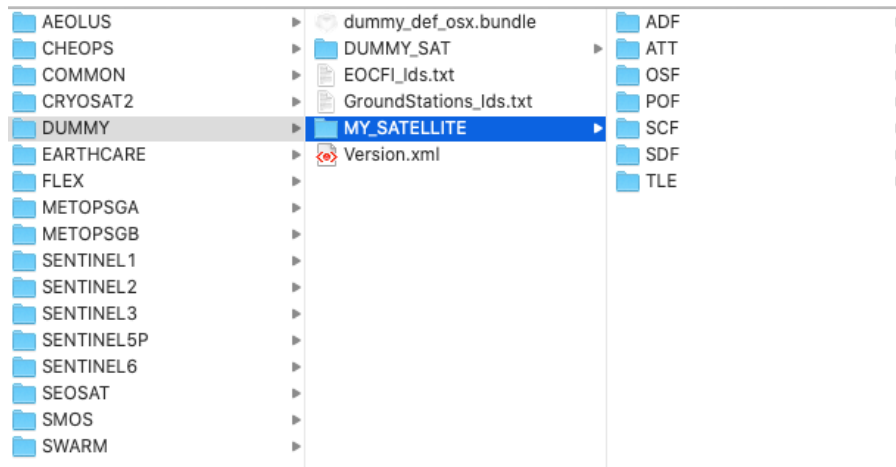
2) In folder './Repos/Satellites/DUMMY/' add or remove ground station names in file GroundStations_Ids.txt. Supported ground station names can be found in the file './Repos/GroundStations.xml'

3) Go to menu item Satellites —> Add Satellite, select DUMMY as Satellite Model and then in Configuration select MY_SATELLITE
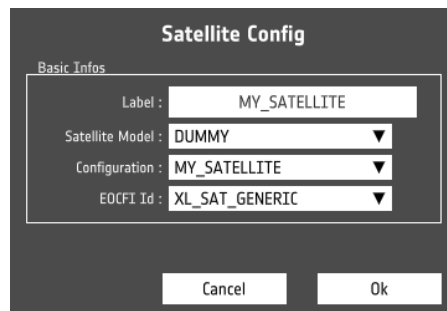
4) Edit the Satellite and Instrument to select the orbit, attitude and swath files, as explained in Sections "Timeline Editor: Scene Elements Tree" and "Satellites".
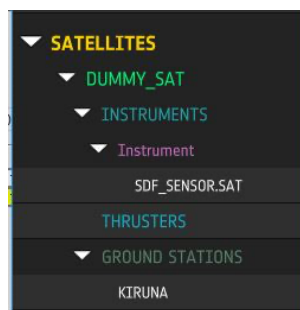
5) Repeat the steps 1) to 4) to add more satellites

About TLE orbit files

It is possible to convert a TLE file into an EO (POF) file using the executable tool TLE2ORBPRE, freely available under the link:
http://eop-cfi.esa.int/index.php/applications/tools/command-line-tools-tle2orbpre

With this executable it is possible to generate a TLE valid for a given time interval starting at the TLE time. For example, the validity of the TLE can be set to 30 days.

For operational missions, TLE files are updated every day, so still it is recommended to regenerate the file often, to avoid running away from actual orbit.

The Predicted Orbit file generated by the executable can then be copied into the "POF" folder and selected by the user in the Edit Satellite configuration window.

Shortcuts Windows/Mac OS X

General

- Quit: Esc or Ctrl Q
- New Project: Ctrl N
- Open: Ctrl O
- Save : Ctrl S
- Save As: Ctrl Shift S
- Contextual Menus: Mouse Right Click
- Full Screen: F11

UI Graphics

- Toggle FPS display: Ctrl F
- Toggle Help /About popup display: Ctrl H
- Toggle UI Overlay display: Ctrl U
- Toggle Sunlight Ray: Ctrl L
- Toggle Moon Ray: Ctrl M

3D View

- Change View: Enter
- View Rotation: Mouse Left Drag
- Zoom: Mouse Scroll or Mouse Right & Left Drag
- View Pan: Mouse Right Drag
- Deploy Satellite Solar Array or Antenna: Right click on satellite part (contextual menu)

Simulation

- Play/Pause: Ctrl Space
- Faster: Ctrl +
- Slower: Ctrl –
- Go to Start: Ctrl Left Arrow
- Go to End: Ctrl Right Arrow
-

Export

- Export Image: Ctrl I
- Movie Export: Ctrl M

Note: 'Ctrl' means: Left or Right 'Control' or 'Command' (also known as 'Super') keys

Left Mouse events are made with a two finger click on OSX Trackpad

Software and Hardware Aspects

Third-party Libraries

SAMIEdit is based on Unity rendering engine v2022.3.40f1. The application also makes use of the EO CFI SW libraries version 4.27 to drive the satellite(s) orbital parameters, instruments swath behaviour and Sun/Moon objects.

System Requirements

SAMIEdit is available for the following computer platforms and operative systems:

- Windows 10 (64-bit application)
- macOS 11 or above for both Intel/ARM (64-bit application)
- iPad iOS 10 or later

The SAMIEdit software requires:

- Windows: Microsoft Visual C++ 2017 Redistributable Package (x64), which can be downloaded from :
  https://aka.ms/vs/17/release/vc_redist.x64.exe
- 1 GB of hard disk space
- Graphic card
  - If the platform only has an integrated graphic card (e.g. Intel® HD Graphics), the display of 3D scenes may not be completely smooth. For some type of older cards, it has been observed flickering of the satellite 3D model.
    - Tested successfully with integrated graphic cards such as Intel® HD Graphics P630
  - If the platform has both a dedicated and an integrated graphic card, make sure you run the executable with the dedicated graphic card.
    - In Windows, this can be ensured by right-click on executable and selecting 'Run with graphics processor'→High-performance NVIDIA processor. Another option is to right-click on the executable and select 'Change default graphics processor…'. Then in 'Program Settings'
    1. Select a program to customize: 'SAMIEdit.exe'
    2. Select the preferred graphics processor for this program: e.g 'High-performance NVIDIA processor'

    - In Mac OSX, the graphic card selection is handled transparently to the user. If you want to ensure the high performance graphic card is used at all times, then in System Preferences → Energy Saver, deselect the 'Automatic graphics switching' checkbox