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HOW TO ADD A USER DEFINED SPACECRAFT TO ESOV

The purpose of this note is to describe how to add a user-defined spacecraft to Esov NG.

1. REFERENCE DOCUMENTS

[REF 1] Earth Observation Mission CFI Software - EO Data Handling User Manual - Date 15/04/2015 - Ref. EO-MA-DMS-GS-0007

[REF 2] Esov NG Software User Manual - Issue 2.3 - Date: 11/12/2015 - Ref. PE-SW-ESA-GS-154 2.3

2. PRELIMINARY STEP: DEFINE MISSION FILES FROM SATELLITE EXAMPLE

The procedure to create a new mission from the satellite example provided as part of the Esov installation package is detailed in the steps below.

- a) On the file system, go to the subfolder 'instrument_swath' in the Esov NG installation directory. Make a copy of the folder "SAT_EXAMPLE" and rename it with the name of the new spacecraft (in capital letters, e.g. NEWSAT)
- b) Go to the new subfolder. Rename the Satellite Identification File (extension .IDF) to the name of the new spacecraft (e.g., NEWSAT.idf)
- c) Edit the IDF file as follows:
 - o Change the filename and the spacecraft name accordingly (e.g. to NEWSAT).
 - o Change the Eecfi_Id to the enumeration value foreseen for this spacecraft, or set to '200' if no enumeration value has been specified yet.
 - o Set the File_Extension, which is used to associate the Swath Definition Files (SDF) to a spacecraft
 - o The orbit parameters in the Default_Settings section need to be updated according to the new mission
 - o The minimum and maximum number of orbits per day (fields Min_Orbits_Day and Max_Orbit_Day) can be translated into minimum and maximum altitude range for the mission, so they need to be updated consistently with the repeat cycle and cycle length values
- d) Add all instruments of the new spacecraft to the 'List_of_Instruments' (or modify the example sensors)
- e) Add the Swath Definition Files (SDF) for all instruments of the new spacecraft to the new subfolder. The spacecraft name and instrument names need to be set consistently in the relevant fields of the SDF files. The SDF file format is described in EO CFI SW Data Handling User Manual [REF 1]
- f) Restart Esov NG and select 'File --> New' in the file menu. The new spacecraft name "NEWSAT" will appear in the drop-down list of spacecrafts and can be selected to create a new scenario

- g) It is recommended to move the folder with the user defined satellite to the “user_instrument_swath” folder in the application directory. In this way the user defined satellite is not overwritten if a newer version of Esov is installed in the same location. Details about where to find the application directory (the location is platform dependent), can be found in Section 2.5.2 of the Esov User Manual [REF 2].

3. PRELIMINARY STEP: INSTALL READY-TO-USE MISSION PACKAGE

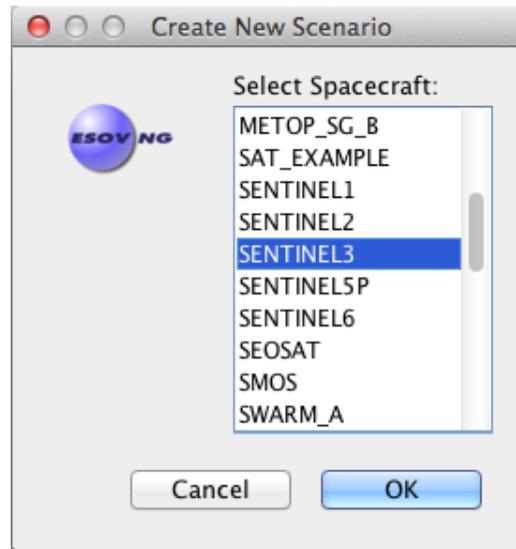
The procedure to install a new mission package (e.g. NEWSAT.zip) is as follows:

- a) On the file system, go to the subfolder 'instrument_swath' in the Esov NG installation directory. Unzip the package and copy the folder "NEWSAT" to the Esov NG application folder
- b) Restart Esov NG and select 'File --> New' in the file menu. The new spacecraft name “NEWSAT” will appear in the drop-down list of spacecrafts and can be selected to create a new scenario
- c) It is recommended to move the folder with the user defined satellite to the “user_instrument_swath” folder in the application directory. In this way the user defined satellite is not overwritten if a newer version of Esov is installed in the same location. Details about where to find the application directory (the location is platform dependent), can be found in Section 2.5.2 of the Esov User Manual [REF 2].

4. SETTING UP THE ESOV NG SCENARIO

The first step is to launch the Esov NG application by double-clicking on the Esov NG icon. The sequence of steps in the following sections uses SENTINEL3 mission as example.

Click on the icon  (which corresponds to menu item File → New Scenario) and select spacecraft SENTINEL3. Click 'Ok'.



The application shows the start-up screen with default elements (see the screenshot below). The contents of the 'Instruments' tool window, the 'Style' and the 'Layer Manager' tool window are displayed on the left side of the application window. The remaining tabs ('Orbit', 'Map', 'Segments', 'Stations', 'Zones', 'SSP') are shown along the right side of the application window.

Note: In case the tool windows tabs are not visible, please reset the layout: Window → Reset Layout

By default, only the 'ORBIT' is set to scope 'ON' in 'Instruments' tool window.



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SENTINEL3 - <unnamed scenario> - Esov NG 2.3

Map 1

7965 km

5302 km

Map 1

Layer Manager

- Geographical Layers
 - Background Image
 - Shore Lines
 - Political Borders
 - Grid
 - Zones
 - Stations
 - POIs
- SENTINEL3
 - ORBIT
 - Station Perimeters
 - Instruments
- User Shapes
- User Background Images

Style

<no layer selected>

SENTINEL3 - Instruments

Use Mission Timelines File (SCF):

Apply SZA [deg.]: 0.0

Id	Scope
MWR	OFF
OLCI	OFF
ORBIT	ON
SLSTR_B	OFF
SLSTR_N	OFF
SRAL	OFF

Apply

Map Overview

Mission: SENTINEL3 / First Orbit: 1 (1999-12-31T22:00:02) / Last Orbit: 1 (1999-12-31T23:41:01)

Ready

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4.1 LOAD ORBIT SCENARIO FILE (OSF)

In the 'Orbit' tool window (tab on the right side of the main window), tick the box 'Use OSF'. The 'OSF File Selection' box appears. Click on the icon  to trigger the 'Open OSF File' file selection dialog. Navigate to the folder where the latest orbit scenario file is located (e.g. S3A_OPER_MPL_ORBSCT_20160216T191845_99999999T999999_0002.EOF) and choose the file.

The list of orbital changes contained in the Orbit Scenario File is displayed under the 'OSF Orbit Settings' section. The last orbital change in the Orbit Scenario file is selected by default. In this particular OSF, the last orbital change is applicable from absolute orbit 233 (UTC 2016-03-04T01:53:03) onwards.

If the desired time interval of the simulation falls within a previous orbital change, then you need to select the orbital change that is applicable.

For further details about how to customize the map and style settings, add stations, zones, switch on/off instruments and compute visibility segments, please check the Esov NG User Manual, which is available both as PDF [REF 2] and embedded in the Esov Help menu.



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SENTINEL3 - <unnamed scenario> - Esov NG 2.3

Map 1

Layer Manager

- Geographical Layers
 - Background Image
 - Shore Lines
 - Political Borders
 - Grid
 - Zones
 - Stations
 - POIs
- SENTINEL3
 - ORBIT
 - Station Perimeters
 - Instruments
- User Shapes
- User Background Images

Style

<no layer selected>

SENTINEL3 - Instruments

Use Mission Timelines File (SCF):

Apply SZA [deg.]: 0.0

Id	Scope
MWR	OFF
OLCI	OFF
ORBIT	ON
SLSTR_B	OFF
SLSTR_N	OFF
SRAL	OFF

Apply

Mission: SENTINEL3 / First Orbit: 1

SENTINEL3 - Orbit

Use OSF:

Use POF/ROF: Swath Update Interval (orbits): 1

Use TLE:

OSF File Selection

P:/OSF/S3A_OPER_MPL_ORBSCT_20160216T191845_99999999T999999_0002.EOF

OSF Orbit Settings

RepCycle	CycleLen	AbsRefOrb	LonAnx	FirstOrb	LastOrb	Drift	Quadratic
838	11945	1	40.300000	1	113	-0.27	0.0000...
454	6473	114	66.404460	114	232	0.00	0.0000...
27	385	233	301.715974	233	99999	0.00	0.0000...

Info

Orbital Period [s]: 6059.22 Equatorial Separation [km]: 104.09

Orbits per day: 14.26 Altitude (max/min/avg) [km]: 832/807/811

Anx. Date: 2016-03-04T01:53:03

Graphical Settings

Orbits Dates

Start Orbit: 233 Start Date: 2016-03-04T01:53:03

of Orbits: 1 Stop Date: 2016-03-04T03:34:02

Points per Orbit: 100 Show Orbits: FULL

Apply

Ready

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4.2 SAVING THE SCENARIO

The scenario settings and visualization options can be saved with the options

File→ Save

or

File → Save As...

in the application main toolbar.

The scenario file is saved in a XML file, and it can be loaded using the menu option

File→ Open.