# EARTH OBSERVATION MISSION CFI SOFTWARE

## Release Notes – C libraries - Version 4.3

## 1   INTRODUCTION

This document describes the changes introduced in this release of the Earth Observation Mission CFI Software, C libraries.

## 2   RELEASE DESCRIPTION

## 2.1 Software

The following table lists the released libraries, their version and issue date:

| Library Name | Version | Issue Date |
|---|---|---|
| File Handling | 4.3 | 06/02/12 |
| Data Handling | 4.3 | 06/02/12 |
| Lib | 4.3 | 06/02/12 |
| Orbit | 4.3 | 06/02/12 |
| Pointing | 4.3 | 06/02/12 |
| Visibility | 4.3 | 06/02/12 |

The libraries installation packages are available for download at the following URL (registration required):

http://eop-cfi.esa.int/eo_cfi_distribution/CURRENT/4.3

## 2.2 Documentation

The following Documents have been updated accordingly:

- EO_FILE_HANDLING SUM issue 4.3
- EO_DATA_HANDLING SUM issue 4.3
- EO_LIB SUM issue 4.3
- EO_ORBIT SUM issue 4.3

- EO_POINTING SUM issue 4.3

- EO_VISIBILITY SUM issue 4.3

- GENERAL SUM issue 4.3

- Mission Convention Document issue 4.3

- Quick Start Guide issue 4.3

The documentation is available for download at the following URL:

http://eop-cfi.esa.int/CFI/EO_CFI_DOCS/4.3

More information on the Earth Observation CFI Software can be found at: the following URL:

http://eop-cfi.esa.int/eo_cfi_distribution

## 2.3 Supported platforms

The following platforms are supported by this release of the CFI:

- **LINUX32_LEGACY**
  - LINUX 32-bits (Legacy)
  - Platform Requirements: x86 based PC, Linux Operating System (Kernel version 2.6.x)
  - Software Requirements: gcc compiler version 4.2.x, glibc (C Library) version 2.7

- **LINUX64_LEGACY**
  - LINUX 64-bits (Legacy)
  - Platform Requirements: x86_64 based PC, Linux Operating System (Kernel version 2.6.x)
  - Software Requirements: gcc compiler version 4.2.x, glibc (C Library) version 2.7

- **LINUX64**
  - LINUX 64-bits
  - Platform Requirements: x86_64 based PC, Linux Operating System (Kernel version 2.6.x)
  - Software Requirements: gcc compiler version 4.5.x, glibc (C Library) version 2.12

- **WINDOWS**
  - Microsoft WINDOWS PC (32-bits)
  - Platform Requirements: x86 based PC, Microsoft Windows XP Operating Systems.
  - Software Requirements: Microsoft Visual C++ Compiler (Visual Studio 2008)

- **MACIN64**
  - MACOSX on Intel (64-bits)
  - Platform Requirements: x86_64 based  Mac Computer, Mac OS X version 10.5.x
  - Software Requirements: gcc compiler version 4.2.x

## 2.4 Installation packages

The CFI libraries are provided as zip packages:

- **EOCFI-4.3-CLIB-LINUX32_LEGACY.zip**
- **EOCFI-4.3-CLIB-LINUX64_LEGACY.zip**
- **EOCFI-4.3-CLIB-LINUX64.zip**
- **EOCFI-4.3-CLIB-MACIN64.zip**
- **EOCFI-4.3-CLIB-WINDOWS.zip**

DEM datasets are distributed separately and are available for download at the following URL:

http://eop-cfi.esa.int/eo_cfi_distribution/DEM

## 2.5 Installation Hints

The CFI libraries can be installed by expanding the installation package in any directory.

For specific hints related to the usage of the libraries, please consult Section 6 "CFI LIBRARIES INSTALLATION" of the General SUM and Section 6 "LIBRARY USAGE" of each Library User Manual.

In order to be able to use the XML validation function in the explorer_data_handling library, it is necessary to install the xerces libraries and the SAX2Count binary. The PATH environment variable shall be pointing at the SAX2Count location.

As of version 4.3, dynamic linking to libxml2 external libraries is no longer required.

## 3  NEW FEATURES

The following new features have been implemented (see section "Known Problems" at the end of this document or of each of the SUMs to check limitations of the current release):

## 3.1 Data Handling Library

- Added support for reading IERS bulletins A and B.
- New functions to decimate orbit and attitude data: xd_orbit_file_decimate, xd_attitude_file_decimate.

## 3.2 Lib Library

- Added new Coordinate System: Pseudo-Earth Fixed.

- Polar motion included in transformations from/to Earth Fixed Coordinate System.

- New function for time id initialization: xl_time_id_init

- New time id initialization modes: with IERS Bulletin A; with IERS Bulletins A+B

- New time transport formats: XL_TRANS_GENERIC_GPS,,XL_TRANS_GENERIC_GPS_WEEK

## 3.3 Orbit Library

- New function for orbit initialization: xo_orbit_id_init.

## 3.4 Pointing Library

- Target functions: iray input variable is now ignored and the ray tracing model is set via the input atmos_id. **Note:** that XP_Target_ray_enum enumeration has been removed from the interface and therefore cannot be used (see "Known Problems" section).

- New attitude model for SENTINEL2 (XP_MODEL_SENTINEL2)

## 4 CLOSED ANOMALIES (SOFTWARE PROBLEMS)

The following Software Problems have been fixed:

| ANR Nr. | Description |
|---|---|
| 364 | Library integrity checks: program shall not use on platform dependent system calls |
| 405 | Runtimes for all functions are obsolete and must be updated |
| 413 | xp_range_rate may fail in some specific condition |
| 415 | Definition of time_id validitiy interval to be clarified in SUMs |
| 417 | gen_swath executable fails in some specific conditions. |
| 445 | Time transformation functions introduce UTC-UT1 correlation different from zero if UTC=UT1 in all records of time_id |
| 447 | shorter nodal period when DUT1 is inserted in OSF |
| 448 | ORBIT SUM xo_orbit_info - Enumeration values of the results vector should be |

|     | given |
| --- | --- |
| 449 | xv_zone_vis_time returns an error if orbit range includes any of the last two orbits in Predicted Orbit file |
| 450 | Wrong result for xv_zone_vis_time using a multi-point swath |
| 452 | Swath generation fails: "Could not propagate the state vector" |
| 453 | xo_orbit_init_file / xo_osv_compute: when init mode = AUTO, it is not clear if interpolation or propagation is done. Doc update |
| 454 | xo_orbit_init file, interpolator mode: when two files are given as inputs and they partially overlap, "fresh" (most recently generated shall be used |
| 457 | Differences observed between UTC ANX time computed using xo_orbit_init_def and xo_orbit_ init_file (with OSF) DOC. DOC update |
| 460 | Wrong TLE satellite name for Sentinel1 A/B |
| 461 | Increase number of decimal digits from 6 to 9 when writing quaternions in attitude file |
| 462 | Segmentation fault when computing OSV for the stop time of restituted orbit file |
| 463 | If the source frame in the attitude_id is set to Earth-Fixed, xp_target_inter returns an error (target not found) |
| 467 | Segmentation fault / wrong result when num_harmonics < 2 in OSF |
| 473 | Remove xl_undulation_geoid from SUM and .h |
| 479 | xp_target_extra_main does not compute the "satellite to target topocentric" parameters |
| 483 | (Java libraries) EECFI.TimeCorrelation.eraseObject(): Segmentation fault |

# 5  KNOWN PROBLEMS

**Pointing Library: target functions (e.g. xp_target_inter):** programs using target functions and XP_Target_ray_enum (e.g. iray=XP_NO_REF) may not compile.

Software applications using target functions may not compile on version 4.3 as the enumeration XP_Target_ray_enum that defines allowed values for the iray input variables has been removed from the interface.

For example, the following piece of code:

```
iray = XP_NO_REF;
```

```
xp_target_inter(...,...&iray,...);
```

will not compile.

The user is expected to use instead the XP_Atmos_mode_enum enumeration:

```
iray = XP_NO_REF_INIT;
```

The same problem is affecting also C++ and Java Libraries in their correspondent target functions.

Please note that, in order to ensure backward compatibility with previous versions of the EOCFI Software, A new anomaly (number 486) has been raised and the problem will be corrected in a future release of the EOCFI Software.