EARTH OBSERVATION MISSION CFI SOFTWARE

Release Notes – Version 4.25

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

Visit us at http://eop-cfi.esa.int/index.php/mission-cfi-software/eocfi-software for more.

1 USER SUPPORT

For any question related to the usage of the EOCFI or to report a problem, please contact:

EOCFI Software Support Team

e-mail: cfi@eopp.esa.int

2 NEW FEATURES & IMPROVEMENTS

Ref./EOCFI-ANR-	Description
705	Support ANX longitude drift (Limited to ORBSCT). See Section 5 for limitations in the implementation and usage of this feature.
911	Added information about customisation of OpenMP parameters through environment variables
946	(Internal) Convert remaining documentation to MS Word format
954	Enhancements in EOCFI C examples
989	(Internal) Clean up in test support files
1007	(Internal) Remove compilation warnings in EOCFI C build

3 SOLVED PROBLEMS

Ref./EOCFI-ANR-	Description
969	Incorrect height calculation when using Standard Atmosphere
990	xv_gen_scf must return an error in case appearance is not valid
1003	Multiple issues corrected in EOCFI Java documentation
1006	Error when setting sat_id for TRUTHS
1009	EOCFI C++ libraries include statically linked 3rd partly dependencies
1010	Incorrect Matrix_Model/Row_*/Column_* documentation
1011	Geolocation runtime (xp_target_inter) degraded between v4.22 and v4.23
1012	Input PSO=0 sometimes results in UTC time & data from previous ANX
1013	Missing figures in Orbit and Pointing C libraries SUMs v4.24
1014	xo_osv_compute_extra: 5 seconds shift in ANX UTC time when input ASCII time is equal to time of orbit change
1015	xv_zonevistime_compute: zone coverage info is assigned to the incorrect zone_id

4 RELEASE DESCRIPTION

4.1 Software

Earth Observation Mission CFI Software 4.24 is composed of the following libraries:

Library Name	Version	Issue Date
File Handling	4.25	31/05/2023
Data Handling		
Lib		
Orbit		
Pointing		
Visibility		
EECommon (*)		

(*) only C++ and JAVA APIs

The core API of the above libraries is written in C and provides an API for C, C++ and Java.

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

http://eop-cfi.esa.int/index.php/mission-cfi-software/eocfi-software/branch-4-x/eocfi-v4x-download

4.2 Documentation

The following documents are available:

Type	Document Name	Version
General	Mission Conventions Document	4.25
	General Software User Manual	
C API	Quick Start Guide	
	File Handling Software User Manual	
	Data Handling Software User Manual	
	Lib Software User Manual	
	Orbit Software User Manual	
	Pointing Software User Manual	
	Visibility Software User Manual	

The documentation is available for download (with C++ and Java APIs also available on-line) at the following URL:

http://eop-cfi.esa.int/index.php/mission-cfi-software/eocfi-software/branch-4-x/eocfi-v4x-documentation

The Earth Observation Mission CFI Software file formats are specified in the EO Mission Software File Format Specification document, which is available in Mission SW File format Specification (ref. PE-ID-ESA-587).

Note: In Section 3.2 of EO CFI File Format Specification (Orbit Scenario File), the element <ANX_Longitude_Drift> and its contents supported from EOCFI SW version 4.25 (latest release).

4.3 Supported platforms

The following platforms are supported by this release of the CFI (the following are requirements for the **C API**):

Designation	Platform/ Architecture	Minimum Platform Requirements	Software Requirements
LINUX64_LEGACY	Linux 64-bit	x86_64 based PC Linux Operating System (Kernel version 2.6.x)	GCC compiler version 4.5.x glibc (C Library) version 2.12 (*)
LINUX64	Linux 64-bit	x86_64 based PC Linux Operating System (Kernel version 4.10.x)	GCC compiler version 6.3.x glibc (C Library) version 2.24
WINDOWS64	Windows 64-bit	x86_64 based PC Microsoft Windows 7	Microsoft Visual C++ Compiler (Visual Studio 2017 Express or Professional edition, 64-bit)
WINDOWS64-V10	Windows 64 bit	x86_64 based PC Microsoft Windows 10	Microsoft Visual C++ Compiler (Visual Studio 2022 Community or Professional edition, 64-bit)
MACIN64	macOS Intel 64-bit	x86_64 based Mac Computer Mac OS X version 10.12.x (Sierra)	Xcode 9.2/Clang compiler frontend

(*) According to gcc documentation, forward compatibility is ensured up to gcc/g++ version 4.9.x.

NOTE for MACIN64 distribution:
As of version 5 of Xcode the default compiler is Clang (see http://clang.llvm.org/). Clang is a compiler front end for C and C++ and can build an application linking against the EOCFI C/C++ libraries. The gcc and g++ program provided within Xcode are aliases for clang.
OpenMP is not supported in AppleClang. Therefore, the –fopenmp compiler option cannot not be used. Functions using parallelized computations, e.g. xp_target_list... functions will operate in single-threading mode.

The following are additional requirements for the **C++ API** (a C++ compiler is required):

- g++ compiler version 4.5.x for LINUX64_LEGACY (*)
  (in MACIN64, g++ is an alias for clang) and g++ compiler version 6.3.x for LINUX64 (*)
- Microsoft Visual C++ Compiler (Visual Studio 2017 Express or Professional edition) for WINDOWS

The following are additional requirements for the **JAVA API** (a JAVA SDK is required):

- Java Standard Edition (SE) version 8 for all platforms

4.4 Distribution Packages

The Earth Observation Mission CFI Software libraries are provided as Zip archives:

API	Package Name	MD5 Checksum
C	EOCFI-4.24-CLIB-LINUX64.zip	96586a8870d2b6a7117e6c6b9267c7e8
C	EOCFI-4.24-CLIB-LINUX64_LEGACY.zip	eadd76d6bfcf3d2b719486da4dd4ba5a
C	EOCFI-4.24-CLIB-MACIN64.zip	e67443420960684eea47cbe7e413df28
C	EOCFI-4.24-CLIB-WINDOWS64.zip	4bfb9c3daa59084f50dc12c2cffe709f
C	EOCFI-4.24-CLIB-WINDOWS64-V10.zip	6b9ace5a7f289dfef12feeaf9f7b3f50
C++	EOCFI-4.24-CPPLIB-LINUX64.zip	cc811a896d7f38c7187d565659a9ee61
C++	EOCFI-4.24-CPPLIB-LINUX64_LEGACY.zip	37a795a7a1930df1d22a6bb0d284ffa8
C++	EOCFI-4.24-CPPLIB-MACIN64.zip	cc811a896d7f38c7187d565659a9ee61
C++	EOCFI-4.24-CPPLIB-WINDOWS64_DLL.zip (*)(***)	61fb631e61e097ac66301773886eae8a
C++	EOCFI-4.24-CPPLIB-WINDOWS64_STA.zip (**)(***)	a93dd02fbb7a7d9064ba71ffd57df74b
C++	EOCFI-4.24-CPPLIB-WINDOWS64_DLL-V10.zip (*)(***)	2ff7a565eb343be20fb4b1c68589353f
C++	EOCFI-4.24-CPPLIB-WINDOWS64_STA-V10.zip (**)(***)	ad1de273898dc469582e86286b24b402
JAVA	EOCFI-4.24-JAVALIB-LINUX64.zip	d20e8890bf8717934eb4a77f18df9215
JAVA	EOCFI-4.24-JAVALIB-LINUX64_LEGACY.zip	666175e8ca11ae40aafb9c1c134cfbef
JAVA	EOCFI-4.24-JAVALIB-MACIN64.zip	6bfc8f891f447dccfea06bfdef821c2f
JAVA	EOCFI-4.24-JAVALIB-WINDOWS64.zip	9dcd75ba894b239bba35935870365d8e
JAVA	EOCFI-4.24-JAVALIB-WINDOWS64-V10.zip	e82edc28b6d245b146fb54129d8b2793

(*) Dynamic libraries (DLLs)

(**) Static libraries

(***) Debug Package will be made available to interested users (please contact support for more information)

Information on how to get and use the supported DEM datasets can be found at the following URL:

http://eop-cfi.esa.int/index.php/mission-cfi-software/eocfi-software/support-files

4.5 Installation Hints

To install Earth Observation Mission CFI Software libraries, simply extract the contents of the distribution package in the desired installation directory. More information on how to install and use the libraries can be found on:

- Section 6 “CFI LIBRARIES INSTALLATION” of the General SUM;
- Section 6 “LIBRARY USAGE” of each Library User Manual.

The Earth Observation Mission CFI Software makes use of the following third-party libraries:

- pthreads (POSIX threads): this library is normally pre-installed in Linux and Mac OS X systems.
  For Windows, the library is provided in the cfi_tools directory within the distribution package.
  Pthreads is covered by the GNU Lesser General Public License.
  (see https://www.sourceware.org/pthreads-win32/copying.html).
- libxml2 (see http://xmlsoft.org/): for reading and writing XML files.
- libgeotiff (see https://trac.osgeo.org/geotiff/)
- libtiff (see http://www.libtiff.org/)
- libproj (see https://proj.org/): for reading ASTER GDEM files.

Terms and conditions for usage of such libraries are detailed in the text file (included in the distribution package) TERMS_AND_CONDITIONS.TXT.

The libraries libxml2, libgeotiff, libtiff and libproj are provided:

- in the C API distribution packages: as separated static libraries (see Section 6 of each User Manual for instruction on how to link them to the application program).
- in the C++ / Java APIs distribution packages: as separated dynamic libraries (see Section 6 of each User Manual for instruction on how to link them to the application program). In the Java API for macOS platform, due to incompatibilities with system libraries, they are instead embedded in the EOCFI libraries.

User applications using the Pointing library need to be built with OpenMP support (adding –fopenmp switch in gcc, see Section 6 of the Pointing User Manual).

OpenMP is not supported in AppleClang (macOS) and Visual C++ (Windows), therefore no additional switch is required. In these platforms the library will operate in single-threading mode.

The XML validation function and tool in the Data Handling library uses the libxml2 library. For Windows platforms, it is required to link the user application with the ws2_32.lib.

5 KNOWN PROBLEMS

This version of the EOCFI hasthe following limitations:

- The orbit (orbit_id) can only be initialized with the ANX longitude drift/offset values using an orbit scenario file (ORBSCT) containing those parameters and via the xo_orbit_init_file function.
- Outputs of explorer_visibility functions will not be correct if orbit_id has been initialized with OSF with ANX longitude drift/offset values.
  Proposed workaround: use gen_pof/gen_rof to generate an OSV(ORBPRE/ORBRES) file from ORBSCT (containing the ANX longitude drift/offset values) and use this ORBPRE/ORBRES to initialize the orbit_id for explorer_visibility.

The updated list of known issues that will be resolved in a future release can be found at the following URL:

http://eop-cfi.esa.int/index.php/mission-cfi-software/eocfi-software/branch-4-x/known-issues-branch-4