EARTH OBSERVATION MISSION CFI SOFTWARE

Release Notes – Version 4.23

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
886	Added support for TRUTHS mission/Updated orbital parameters of CRISTAL mission
928	Added function xl_time_free_id_data to release xl_time_id_data resources
929	Enabled setVerbose/Silent in EOCFI Java API
932	Enabled initialization of Orbit from TLE files (C++ and Java API)
945	Enabled definition of SP3 identifier through Satellite Configuration File
967	Increased maximum number of files that can be loaded concurrently
949/963/981	Miscellaneous Documentation updates, including: - Disclaimer to users regarding inability to use EOCFI C++ in Debug build on Windows/Visual Studio - Updated warnings and errors table for xp_target_inter

3 SOLVED PROBLEMS

Ref./EOCFI-ANR-	Description
904	Enabled the use of NULL for unused orbit_num, anx_time, orbit_duration parameters in xl_time_ref_init
921	Corrected Compilation warnings with latest GCC/Clang versions
930	Corrected pixel interpretation for ASTER GDEM and TanDEM-X
944	Corrected reference frame in OSV record after loading orbit from OEM file (C++ API)
955	Corrected loading procedure for ASTER GDEM TIFF-based tiles
957	Corrected memory mishandling issues in Visibility library (Windows)
958	Corrected issued related to generation of TLE data files (xo_gen_tle function and gen_tle CLI utility)
959	Enabled calculation eclipse times even when SZA entry/exit times calculation is not possible (xv_orbit_extra)
961	Corrected mishandling of mismatch between Swath Template File and orbit nodal period (xv_zoneviztime_compute)
965	Enabled loading Swath Definition File containing specification of <File_Model>
968	Corrected memory mishandling issues related target calculations in case warnings are thrown (C++ API)
971	Corrected mishandling of time filter when loading ATTREF file
982	Corrected Visibility example to produce valid Swath Control File

4 RELEASE DESCRIPTION

4.1 Software

Earth Observation Mission CFI Software 4.23 is composed of the following libraries:

Library Name	Version	Issue Date
File Handling	4.23	27/06/2022
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	4.23
	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 are not supported by the latest EOCFI SW version.

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)
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-4.22-CLIB-LINUX64.zip	b3bcaf20e0405de7faa211c10cea735c
C	EOCFI-4.22-CLIB-LINUX64_LEGACY.zip	1d49bf78d631a7b29a65a1d02490c79e
C	EOCFI-4.22-CLIB-MACIN64.zip	b1649aacd28e73840671b7588bff42cf
C	EOCFI-4.22-CLIB-WINDOWS64.zip	ed2ec80eac894fb47126bb39bf18d613
C++	EOCFI-4.22-CPPLIB-LINUX64.zip	a892456a46ba28e21211b5271b036c27
C++	EOCFI-4.22-CPPLIB-LINUX64_LEGACY.zip	3ad0aa94238ede6c290f8c7363a3cd3e
C++	EOCFI-4.22-CPPLIB-MACIN64.zip	57f305d135fc528ce554749772bddc03
C++	EOCFI-4.22-CPPLIB-WINDOWS64_DLL.zip (*)(***)	31ef45f66031c717ae7af1363451495f
C++	EOCFI-4.22-CPPLIB-WINDOWS64_STA.zip (**)(***)	74a190f27136cf12f2920543ce234a13
JAVA	EOCFI-4.22-JAVALIB-LINUX64.zip	46c53c6cef1d31d7b12e036f33e5aecd
JAVA	EOCFI-4.22-JAVALIB-LINUX64_LEGACY.zip	6e76641afeedb4299bf4cfec8da5d170
JAVA	EOCFI-4.22-JAVALIB-MACIN64.zip	db174a6536ad656c87ca830b651ddf84
JAVA	EOCFI-4.22-JAVALIB-WINDOWS64.zip	60741c383a07a8fa095fb82a7e6797e3

(*) 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 MAC OS X 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 (Mac OS X) 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

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