EARTH OBSERVATION MISSION CFI SOFTWARE

Release Notes – Version 4.17

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

Ref./EOCFI-ANR-	Description
0740	Added support for Generic DEM raster format
0762 0771	Updated Java API to allow explicitly release resources. *This change effectively aligns the Java API with the C API. The Java constructors are mapped to the C *_init() functions, and the newly available Java .close() methods are mapped to the *_close() functions. Given the explicit resource management, the implementation was also simplified to avoid unnecessary object copies between Java and C native interfaces.*
0778	Enabled direct grid access to DEM cell values

3 SOLVED PROBLEMS

Ref./EOCFI-ANR-	Description
0743	Corrected leap second representation when converting Processing time to ASCII format
0752	Corrected the setup of custom azimuth/elevation when using xp_set_az_el_definition
0753	Corrected orbit initialization when using xo_orbit_init_def with inclination
0754	Corrected orbit initialization to ensure xo_orbit_init_def and xo_orbit_init_file produce the same result
0758	Corrected handling of Swath Definition Files when using type XV_FILE_STF
0769	Removed spurious error messages generated during orbit initialization due to internal error handling issue
0772	Corrected orbit initialization from CryoSat DORIS Navigation files
0781	Corrected DEM intersection solution when using XP_STD_INIT Atmosphere
0782	Removed spurious error messages generated during time initialization due to internal error handling issue
0783	Corrected time/orbit initialization based on DORIS Navigation files
0784	Removed spurious error messages generated during orbit initialization from ORBPRE files
0785	Adjust orbit validation diagnostics obtained after reading multiple POD orbit files
0787	Removed spurious warning messages generated when loading Orbit Scenario File
0788	Removed restriction regarding presence of J2000 Navigation packets in DORIS Navigation files (affecting C++ API only)
0791	Corrected crash on call to xp_target_range
0792	Corrected OSF-based orbit initialization against the time initialized from ROF orbit file
0793	Corrected the time conversion from XL_PROC to XL_ASCII_CCSDSA_COMPACT
0798	Corrected Swath initialization to allow using initialized Atmosphere definition
0799	Corrected the setup of default satellite XL_SAT_DEFAULT5

4 RELEASE DESCRIPTION

4.1 Software

Earth Observation Mission CFI Software 4.17 is composed of the following libraries:

Library Name	Version	Issue Date
File Handling	4.17	28 May 2019
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	4.17
	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 at the following URL:

http://eop-cfi.esa.int/Repo/PUBLIC/DOCUMENTATION/SYSTEM_SUPPORT_DOCS/PE-ID-ESA-GS-584-1.4-EO_Mission_SW_File_Format_Specs.pdf

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 Clang. 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-4.17-CLIB-LINUX64.zip	84cea94048804ac64d0cf7c4ada4568b
C	EOCFI-4.17-CLIB-LINUX64_LEGACY.zip	64ec7702852841e5f081c05a3018202e
C	EOCFI-4.17-CLIB-MACIN64.zip	008179a8bc48a8f6ae0a0546ef6a41aa
C	EOCFI-4.17-CLIB-WINDOWS64.zip	b3ab0e137b7faa7bd34e67c5ebc868d5
C++	EOCFI-4.17-CPPLIB-LINUX64.zip	f12b070a5604a21dfb768a4138f9f779
C++	EOCFI-4.17-CPPLIB-LINUX64_LEGACY.zip	a95fbee1ef14d1945e075994437621d9
C++	EOCFI-4.17-CPPLIB-MACIN64.zip	046222b75bd6c33711d86b6bc4f13a61
C++	EOCFI-4.17-CPPLIB-WINDOWS64_DLL.zip (*)	36f6d61bd9389a3443aad1dcb4773b15
C++	EOCFI-4.17-CPPLIB-WINDOWS64_STA.zip (**)	353946d74652359aa27a22e26c823b87
JAVA	EOCFI-4.17-JAVALIB-LINUX64.zip	32e086641be00dbb50d3c13119463e5f
JAVA	EOCFI-4.17-JAVALIB-LINUX64_LEGACY.zip	b7cc0c342f463032e65e90e39ad3c7dd
JAVA	EOCFI-4.17-JAVALIB-MACIN64.zip	6b14a1746a08cc7f3abed232873dd535
JAVA	EOCFI-4.17-JAVALIB-WINDOWS64.zip	a83df9d0d9b7e493ee367ecb2ff7388e

(*) Dynamic libraries (DLLs) / (**) Static libraries

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 http://trac.osgeo.org/geotiff/)
- libtiff (see http://www.libtiff.org/)
- libproj (see http://trac.osgeo.org/proj/): 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 clang (Mac OS X) and Visual Studio (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