EARTH OBSERVATION MISSION CFI SOFTWARE

Release Notes – Version 4.19

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
0822	Defined size of file paths based on X*_MAX_PATH macro
0823	Corrected setSilent()/setVerbose() for EOCFI C++ libraries
0827	Enabled support for ASTER Global Digital Elevation (GDEM) V3
0834	Enabled support for <Reference_Frame> tag in Attitude Angles files
0850	Enabled orbit initialization based on CCSDS OEM XML files
0851	Enabled using repeat cycle of 1 day in OSF
0837	Improvements to the Software Manual

3   SOLVED PROBLEMS

Ref./EOCFI-ANR-	Description
0833	Extended xv_orbit_extra to allow calculating results up to 2050
0835	Corrected xp_sat_nominal_att_init_file to handle star tracker attitude files
0836	Corrected xp_instr_att_init_file to handle star tracker attitude files
0846	Adjusted internal threshold to allow calculate Aeolus nominal attitude reference frame in xp_attitude_compute
0847	Enabled passing NULL as unused time1/time0 and orbit0/orbit1 parameters in xl_time_ref_init_file and xo_orbit_init_file
0848	Corrected memory leak in xl_change_cart_cs when converting from XL_BM1950 to XL_BM2000

4   RELEASE DESCRIPTION

4.1   Software

Earth Observation Mission CFI Software 4.19 is composed of the following libraries:

Library Name	Version	Issue Date
File Handling		
Data Handling		
Lib		
Orbit	4.19	29/05/2019
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	
	General Software User Manual	
C API	Quick Start Guide	
	File Handling Software User Manual	
	Data Handling Software User Manual	4.19
	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-584-1.5-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 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-4.19-CLIB-LINUX64.zip	50a5d27c4236e68a1c263af090c9e1b9
C	EOCFI-4.19-CLIB-LINUX64_LEGACY.zip	96cacfde3451b22b301a535580118d9b
C	EOCFI-4.19-CLIB-MACIN64.zip	9c2db56f20ad33a648e1e9f3476c8945
C	EOCFI-4.19-CLIB-WINDOWS64.zip	3a4634230a40e2d91004a819a067303c
C++	EOCFI-4.19-CPPLIB-LINUX64.zip	3db272becbac7c5b9ea7ff49678aabba
C++	EOCFI-4.19-CPPLIB-LINUX64_LEGACY.zip	03ba9aa071c3e4d3a60f2ff5a65d6c1e
C++	EOCFI-4.19-CPPLIB-MACIN64.zip	3bb1ad4528c879f13c50de8daa99bf57
C++	EOCFI-4.19-CPPLIB-WINDOWS64_DLL.zip (*)	3c5a0b32c165ee90fc028c39111c3e91
C++	EOCFI-4.19-CPPLIB-WINDOWS64_STA.zip (**)	caff6001a94faae49089f5aebe12aefc
JAVA	EOCFI-4.19-JAVALIB-LINUX64.zip	33e8d244bd7ca6e99b40495bdf4cd97e
JAVA	EOCFI-4.19-JAVALIB-LINUX64_LEGACY.zip	6c370e6c7c706d4954f608d639cdb670
JAVA	EOCFI-4.19-JAVALIB-MACIN64.zip	4a13567f5fa9082acffa0603b0bb5489
JAVA	EOCFI-4.19-JAVALIB-WINDOWS64.zip	1e1a9ae3dfaf62da61f53475bd7e3121

(*) 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 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