EARTH OBSERVATION MISSION CFI SOFTWARE

Release Notes – Version 4.16

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 information on the Earth Observation CFI Software.

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
0672	New functionality to calculate Area of Interest based on SDF and time interval
0677	Added support for field of view definition of Sun/Moon looking instrument
0692	New functionality to perform orbit data check/validation (w.r.t. to configurable thresholds)
0719	Added user-friendly definition (enums) of attitude model parameters
0726	Enabled support for ACE2 DEM 5arcmin
0751	Enabled support of TLE for Sentinel-5P, Sentinel-3B and Aelous

3 SOLVED PROBLEMS

Ref./ EOCFI-ANR-	Description
0693	Improved the runtime performance of search for time_id (non-functional change expected to improve overall performance)
0725	Corrected the calculation of the Mean Local Solar Time drift
0734	Adjusted limitation of number of characters in input paths to accept path lengths up to the limit imposed by the Linux kernel
0735	Enabled deterministic resource in the Java API by making Attitude and Target implement AutoCloseable
0741	Corrected the configuration of MetopSG attitude using Attitude Definition File (ATTDEF)
0744	Consolidated the #include list in C++ API
0745	Removed hardcoded runtime search path (i.e. rpath) from MacOS dynamic libraries
0746	Enabled handling void values in DEM (warning when geolocating using void values; indirect use of void values reported as error)
0757	Corrected issue in schema validation of DEM configuration files
0760	Corrected error handling related to computation of attitude based on quaternions

4   RELEASE DESCRIPTION

4.1 Software

Earth Observation Mission CFI Software 4.16 is composed of the following libraries:

Library Name	Version	Issue Date
File Handling		
Data Handling		
Lib		
Orbit	4.16	14 November 2018
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	4.16
	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-584-1.3-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-4.16-CLIB-LINUX64.zip	fdec1e4ed1e95b185b773ed41e59054d
C	EOCFI-4.16-CLIB-LINUX64_LEGACY.zip	37b4955f811400a4dd14786c3b5d6556
C	EOCFI-4.16-CLIB-MACIN64.zip	617af842a5f1558f8cf7a55af073cb90
C	EOCFI-4.16-CLIB-WINDOWS64.zip	1ab7976ddace2aa941120fa8f9d26da0
C++	EOCFI-4.16-CPPLIB-LINUX64.zip	24d7d330a65e134eabe19547c0bec4f8
C++	EOCFI-4.16-CPPLIB-LINUX64_LEGACY.zip	eca78aa5c797dcf488e1c967fe945a54
C++	EOCFI-4.16-CPPLIB-MACIN64.zip	dc79a3c4129dcd4ca00aa0316810facf
C++	EOCFI-4.16-CPPLIB-WINDOWS64_DLL.zip (*)	80ada87b2eaabd0c3f047143a7be9814
C++	EOCFI-4.16-CPPLIB-WINDOWS64_STA.zip (**)	2ee9f0abc301af4824bc5a881036dd1e
JAVA	EOCFI-4.16-JAVALIB-LINUX64.zip	37f95b5441eb205189a0f51a25300b22
JAVA	EOCFI-4.16-JAVALIB-LINUX64_LEGACY.zip	808662722196e3236e99ada7e56cb4e2
JAVA	EOCFI-4.16-JAVALIB-MACIN64.zip	75a6bd160d1a08d840689d8d6f1e24ec
JAVA	EOCFI-4.16-JAVALIB-WINDOWS64.zip	3a5e14759d4885647c7235dca640818b

(*) 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