



PREPARATION AND OPERATIONS OF THE MISSION PERFORMANCE CENTRE
(MPC) FOR THE COPERNICUS SENTINEL-3 MISSION

Product Data Format Specification - OLCI Level 1
Products



*Mission
Performance
Centre*



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Author(s):	ACRI-ST IPF Team		
Approved by:	Olivia Lesne, QA Manager	Authorized by	Frédéric Rouffi, S3 IPF Manager
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ACRI-ST

260 route du Pin Montard

06904 Sophia-Antipolis, France

Tel: +33 (0)492 96 75 00 Fax: +33 (0)4 92 96 71 17

www.acri-st.fr

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TABLE OF CONTENTS

AMENDMENT RECORD SHEET.....	8
1. INTRODUCTION.....	12
1.1 Purpose and Scope.....	12
1.2 Structure of the Document	12
1.3 Applicable and Reference Documents.....	12
1.3.1 Applicable documents	12
1.3.2 Reference documents	13
1.4 Terms, Definitions and Abbreviated Terms.....	13
1.5 Intellectual property rights for specific parts this document	14
2. OVERVIEW OF THE INSTRUMENT: OLCI	15
3. PRODUCT OVERVIEW	16
3.1 Product Tree	16
3.1.1 Science Products Tree	16
3.1.2 Browse Products Tree	17
3.2 Product Naming Convention	17
4. OLCI PRODUCT FORMAT SPECIFICATION: COMMON PART	18
4.1 General Product Structure	18
4.1.1 Package Layout.....	18
4.1.2 Manifest file.....	18
4.1.2.1 Primary Metadata	18
4.1.2.2 Secondary Metadata.....	18
4.1.3 Measurement Data Files and Annotation Data Files.....	19
4.1.3.1 Common additional global attributes	19
4.2 Earth Observation Products.....	20
4.2.1 Common Measurement Files	20
4.2.1.1 Integrated Water Vapour	20
4.2.2 Common Annotation Files	21
4.2.2.1 Time Coordinates	21
4.2.2.2 Geo Coordinates.....	22
4.2.2.3 Geo Coordinates Tie-Points	23
4.2.2.4 Geometries Tie-Points	24
4.2.2.5 Meteorology Tie-Points.....	25
4.2.2.6 Instrument Data	28
5. MANIFEST FILE DESCRIPTION: COMMON PART	30
5.1 Metadata Section	30
5.2 Data Object Section	30
5.2.1 Common annotation Data Files	30
6. XML SCHEMA	38
7. OLCI PRODUCT FORMAT SPECIFICATION	40
7.1 Earth Observation Products.....	40
7.1.1 Level 1 Products: OL_1_EFR___/OL_1_ERR___	40
7.1.1.1 Package Description.....	40
7.1.1.2 Manifest File.....	43
7.1.1.3 Measurement Data Files.....	43
7.1.1.4 Annotation Data Files	47
7.2 Calibration Products.....	51
7.2.1 Radiometric Calibration: OL_1_RAC___.....	51
7.2.1.1 Package Description.....	51
7.2.1.2 Manifest File.....	53
7.2.1.3 Measurement Data Files.....	53
7.2.1.4 Annotation Data Files	54
7.2.2 Spectral Calibration: OL_1_SPC___	56
7.2.2.1 Package Description.....	56
7.2.2.2 Manifest File.....	58

7.2.2.3	Measurement Data Files.....	58
7.2.2.4	Annotation Data Files	60
7.3	Browse Products	64
7.3.1	Manifest File	64
7.3.1.1	Wrapped Metadata	64
7.3.2	Level 1 products: OL_1_EFR_BW/OL_1_ERR_BW	64
7.3.2.1	Package Description.....	64
7.3.2.2	Measurement Data Files.....	65
8.	MANIFEST FILE DESCRIPTION	66
8.1	InformationPackageMap	66
8.1.1	“OL_1_EFR___” Level 1 Product	66
8.1.2	“OL_1_ERR___” Level 1 Product.....	69
8.1.3	“OL_1_RAC___” Level 1 Product.....	71
8.1.4	“OL_1_SPC___” Level 1 Product.....	73
8.1.5	“OL_1_EFR_BW/OL_1_ERR_BW” L1 Browse Products.....	74
8.2	Metadata Section	74
8.3	Data Object Section	75
8.3.1	Measurement Data File	75
8.3.1.1	“OL_1_EFR” Level 1 Product	75
8.3.1.2	“OL_1_ERR” Level 1 Product.....	78
8.3.1.4	“OL_1_RAC___” Level 1 Product.....	80
8.3.1.6	“OL_1_SPC___” Level 1 Product.....	81
8.3.1.8	“OL_1_EFR_BW/OL_1_ERR_BW” L1 Browse Products.....	82
8.3.2	Specific Annotation Data File	83
9.	PRODUCT SIZE	86
9.1	OLCI Level 1	86
9.1.1	EO mode (OL_1_EFR___/OL_1_ERR___)	86
9.1.2	Radiometric Calibration mode (OL_1_RAC___)	87
9.1.3	Spectral calibration mode (OL_1_SPC___)	87
9.2	Browse products	87

LIST OF FIGURES

Figure 3-1: OLCI Product Tree	16
Figure 4-1: XFDU package.....	18

LIST OF TABLES

Table 1-1: Document Structure	12
Table 3-1: OLCI products tree	16
Table 3-2: OLCI Browse Products Tree	17
Table 3: Additional global attributes common to OLCI L1 and L2 products.....	19
Table 4-4: OL_2_WFR___/OL_2_WRR___/ OL_2_LFR___/OL_2_LRR IWV description	20
Table 4-5: Time annotation data file description	21
Table 4-6: Geo coordinates annotation data file description.....	22
Table 4-7: Geo coordinates tie points annotation data file description	23
Table 4-8: Geometries tie points annotation data file description	24
Table 4-9: Meteorological tie points annotation data file description	26
Table 4-10: Instrument data annotation data file description	29

Table 5-1: Time coordinates Metadata Object	31
Table 5-2: Geo-coordinates Metadata Object	32
Table 5-3: Tie geo-coordinates Metadata Object	33
Table 5-4: Tie geometries Metadata Object	34
Table 5-5: Tie meteo Metadata Object	35
Table 5-6: Instrument data Metadata Object	36
Table 5-73: OLQC annotation Metadata Object	37
Table 7-1: OLCI Full Resolution Level 1 product physical composition	41
Table 7-2: OLCI Reduced Resolution Level 1 product physical composition	42
Table 7-3: Secondary Metadata for OLCI products.....	43
Table 7-4: OL_1_EFR___/OL_1_ERR___: radiance Oa## description.....	44
Table 7-5: OL_1_EFR___/OL_1_ERR___: radiance uncertainty Oa## description.....	44
Table 7-6: OL_1_EFR___: removed pixel description	46
Table 7-7: OL_1_EFR___/OL_1_ERR___: quality flags annotation data file description	47
Table 7-8 – Detailed structure of the quality flags variable	48
Table 7-9 – List of allowed values to be taken by flags attributes.....	50
Table 10: Additional Global Attributes for OLCI L1 files in RAC mode	51
Table 7-11: OLCI Radiometric Calibration Level 1 product physical composition	52
Table 7-12: Secondary Metadata for OLCI products.....	52
Table 7-13: OL_1_RAC___ radiometric_coef description.....	54
Table 7-14: OL_1_RAC___ RC_annotation description	56
Table 7-15 – Detailed structure of the one-byte Quality Flags variable	56
Table 7-16: OLCI Spectral Calibration Level 1 product physical composition	57
Table 7-17: Secondary Metadata for OLCI products.....	58
Table 7-18 – OL_1_SPC___ cal_wavelengths description.....	59
Table 7-19 – OL_1_SPC___ time annotation data file description	60
Table 7-20 – OL_1_SPC___ SC_annotation annotation data file description	62
Table 7-21 – Detailed structure of the one-byte Quality Flags variable	62
Table 7-22 – List of allowed values to be taken by flags attributes.....	63
Table 7-23: OLCI Full/Reduced Resolution Browse L1 Product physical composition.....	65
Table 8-1: Information Package Map for L1 OLCI Full Resolution product	68
Table 8-2: Information Package Map for L1 OLCI Reduced Resolution product.....	71
Table 8-3: Information Package Map for L1 Radiometric Calibration OLCI Product	72
Table 8-4: Information Package Map for L1 Spectral Calibration OLCI Product	73
Table 8-5: Information Package Map for L1 OLCI Browse Products	74
Table 8-6: OL_1_EFR Level 1 measurements Data Objects	77
Table 8-7: OL_1_ERR Level 1 Data Objects	79
Table 8-8: OL_1_RAC Level 1 Data Object	80
Table 8-9: OL_1_SPC Level 1 Data Object	81
Table 8-10: OLCI Browse Level 1 Data Object	82

Table 8-11: Quality flags Metadata Object	83
Table 8-12: Rc annotation Metadata Object.....	84
Table 8-13: Sc annotation Metadata Object.....	85
Table 9-1: OL_1_EFR___/OL_1_ERR___ product size	86
Table 9-2: OL_1_RAC___ product size	87
Table 9-3: OL_1_SPC___ product size.....	87

AMENDMENT POLICY

This document shall be amended by releasing a new edition of the document in its entirety. The Amendment Record Sheet below records the history and issue status of this document.

Amendment Record Sheet

ISSUE	DATE	REASON
1.0	01 Oct 2012	DR1 data-package release
1.1	18 Dec 2012	DR1 update and DR2 release
1.2	12 Feb 2013	Change of Template
1.3	04 Dec. 2013	DR2 update
1.4	24 Mar 2014	RIDs and SPRs correction update
1.5	31 Mar 2014	PDGS PRE-V2 alignment
1.6	15 May 2014	DV2 update
1.7	23 July 2014	Correction of typos
1.8	18 Nov 2014	Correct error on reduced resolution product size
1.9	10 Feb 2015	Update references
1.10	28 May 2015	Implementation of the launch critical changes
2.0	30 May 2016	Implementation of the minor changes
2.2	09 Oct 2017	Documentation split into: L1, L2 land and L2 marine volumes
2.3	22 Mar 2019	ESA-EOPG-CSCOP-CR-0089 Joint CR: OLCI RC in-flight BRDF model (new variables in OL_1_RAC level 1 product)
2.4	29 Mar 2019	ESA-EOPG-CSCOP-CR-0077 Joint CR: processing of modified OLCI Radiometric Calibration Sequence S04 without diffuser measurements.
2.5	29 Apr 2022	S3PDGSJCR-172 OLCI L1 IPF including radiometric uncertainty computation

Document Change Record

No.	Change in Issue	Description	Affected Section
1	1.1	S3IPF-319: length of product type set to 11 characters.	
2	1.1	S3IPF-372: Secondary metadata for OLCI L1 SPC is maintained in Excel file only.	
3	1.1	S3IPF-390: browse product manifest description pushed to metadata specification document	

No.	Change in Issue	Description	Affected Section
4	1.1	S3IPF-450: global attributes are referred to from the "product structures" volume of the PDS.	
5	1.1	S3IPF-451: CF standard name use is defined in the product structure volume.	
6	1.1	S3IPF-456 and S3IPF-487: Quality flags details provided.	
7	1.1	S3IPF-457: manifest content refers to Excel file. Clarification on the number of browse images.	
8	1.1	S3IPF-458: References and links repaired throughout the document.	
9	1.1	S3IPF-472: Secondary metadata for OLCI L1 SPC is maintained in Excel file only.	
10	1.1	S3IPF-475: Manifest section reviewed	
11	1.1	S3IPF-485: global attributes are referred to from the "product structures" volume of the PDS. All justification for not including all attributes are in this document.	
12	1.1	S3IPF-486: DEM_corrected_longitude changed to longitude (same for latitude).	
13	1.1	S3IPF-507: column availability to the user removed.	
14	1.1	S3IPF-520: add caption to tables, correct TOC errors, correct wrong references.	
15	1.2	Change of template.	Entire document
16	1.3	S3IPF-390: secondary metadata reference for Browse products removed	4.4
17	1.3	S3IPF-457: Improve browse product description	4.4.3
18	1.3	S3IPF-487: Straylight risk flag included in the flag definitions	4.2.1.3.1
19	1.3	S3IPF-913 and 912: special changed to spatial, radiometric to spectral	7.1.3
20	1.3	S3IPF-922: change manifest name in table 4-1 and link to section	4.2.1.1
21	1.3	S3IPF-928: clarify the scope of table 4-22	4.2.2.4.1.2
22	1.3	S3IPF-929: harmonize the definition of the global attributes	4.3.2.4.2

No.	Change in Issue	Description	Affected Section
23	1.3	S3IPF-792 and 930: remove the reference to specific metadata and to DPM	4.4.1
24	1.3	S3IPF-794: update of AD references	5.2
25	1.3	S3IPF-932: package map of the products updated	5.1
26	1.3	S3IPF-687: Section 4.2.1.2 renamed to Manifest file	4.2.1.2
27	1.3	S3IPF-689 and 793: Reference to SLSTR removed	5
27	1.3	S3IPF-686: Package summary completed, introductory sentence reworded	4.2.1.1
28	1.3	S3IPF-692: Size of the products updated	7
29	1.3	S3IPF-693: Driver TN reference replaced	7.1.1
30	1.3	S3IPF-691: Driver TN reference replaced with product structure document	5.2
31	1.3	S3IPF-694: List of AD and RD updated	1.3
32	1.3	S3IPF-699: OLQC section removed	4.2.2.4.2
33	1.3	S3IPF-787: IWV description moved to a common section for water and land products	4.2.2.3, 4.2.3.3
34	1.3	S3IPF-789: water replaced with land in description field	4.2.3.1.1
35	1.3	S3IPF-790: clarification for reference pressuer levels variable	4.2.4.5
36	1.3	Harmonization for S3IPF-696	4.1.2
37	1.3	S3IPF-907: RISKGLINT changed to HIGHGLINT	4.2.2.4.1.1
38	1.4	Information package map and data object section update	5.1, 5.3
39	1.5	Wrong ADFS reference (S3IPF-457)	4.4
40	1.5	AD reference update	1.3.1
41	1.6	AD reference update	1.3.1
42	1.7	Correct typos in the content of instrument_data.nc file	Table 4-1, 4.2, 4-9, 4-22
43	1.8	Correct error on product size for the RR (1 TP every row)	7
44	1.8	Remove unit for Level 2 reflectance	4.2.2.3.1
45	1.9	Reference update	1.3
46	1.10	Additional global attributes	4.1.3.1
47	1.10	Complete product variable attributes	4.2

No.	Change in Issue	Description	Affected Section
48	1.10	Addition of OTCI_quality_flags variable	4.2.3.3.2
49	1.10	Deletion of flag OTCI_CLASS_ANG	4.2.3.4.1
50	2.2	Common and Level 1 information are gathered in a separate document	
51	2.3	Addition of 3 variables in OL_1_RAC product's annotation data file	7.2.1.4.1
52	2.4	Added specific _FillValue specifications to all variables related to diffuser measurement within the OLCI Level 1 Radiometric Calibration Product (OL_1_RAC___)	7.2.1.3.1, 7.2.1.4.1
53	2.5	Align Browse Products Tree with issue 2.4 of S3IPF.PDS.004.2 OLCI Land Products	3.1.2
54	2.5	Align Common Measurement Files with issue 2.4 of S3IPF.PDS.004.2 OLCI Land Products	4.2.1.1
55	2.5	S3PDGSJCR-172: Update of the OL_1_EFR___/OL_1_ERR___ package description	7.1.1
56	2.5	S3PDGSJCR-172: deleted the Oa##_radiance_err variables from the Radiance files	7.1.1.3.1
57	2.5	S3PDGSJCR-172: Introduce the Radiance uncertainty files description as additional section	7.1.1.3.2
58	2.5	S3PDGSJCR-172: section number of Removed Pixels file description incremented by 1	7.1.1.3.3
59	2.5	S3PDGSJCR-172: align the storage format of Removed Pixels' Uncertainty Estimates to that of Radiance uncertainty files	7.1.1.3.3
60	2.5	S3PDGSJCR-172: introduction of the uncertainty variables in the radiometric calibration Measurement Data file	7.2.1.1.1, 7.2.1.3.1
61	2.5	S3PDGSJCR-172: addition of manifest information corresponding to the new Radiance uncertainty files	8.1.1, 8.1.2, 8.3.1.1, 8.3.1.2
62	2.5	S3PDGSJCR-172: update file sizes for OL_1_EFR, OL_1_ERR and OL_1_RAC products	9.1.1, 9.1.2

1. INTRODUCTION

1.1 Purpose and Scope

This document aims to identify and specify the format of Sentinel 3 OLCI Level 1 products, browse products included.

1.2 Structure of the Document

In addition to this introduction, the document is divided into a number of major sections that are briefly described below:

Chapter Number	Title	Contents
1	INTRODUCTION	This section.
2	OVERVIEW OF THE INSTRUMENT: OLCI	A description of the main features and characteristics of the OLCI instrument is provided here.
3	PRODUCT OVERVIEW	The Product Tree for OLCI instruments and the product names convention are specified here.
4	OLCI PRODUCT FORMAT: COMMON PART	In this section the format of each OLCI common elements is specified. NetCDF Data Files of each product are reported in this section.
5	MANIFEST FILE: COMMON PART	In this section details for the implementation of the common part of the manifest file is provided.
6	XML SCHEMAS	In this section details of the schemas used to generate the manifest is provided.
7	OLCI PRODUCT FORMAT	In this section the format of each OLCI Level 1 is specified. NetCDF Data Files of each product are reported in this section.
8	MANIFEST FILE	In this section details for the implementation of the manifest file is provided.
9	PRODUCT SIZE	In this section the size of each file composing the OLCI products is provided.

Table 1-1: Document Structure

1.3 Applicable and Reference Documents

1.3.1 Applicable documents

The following table lists the documents with a direct bearing on the content of this document.

ID	Document	Reference
AD- 1	Sentinel 3 PDGS File Naming Convention	EUM/LEO-SEN3/SPE/10/0070 GMES-S3GS-EOPG-TN-09-0009, 1.4, 24/06/2016
AD- 2	Product Data Format Specification - Product Structures	S3IPF.PDS.002, Issue 1.7, 09/10/2017
AD- 3	Drivers for the S3 PDGS Processing Function Implementation	GMES-GSEG-EOPG-TN-11-0062, i1r7, 27/06/2014
AD- 4	Metadata Specification, Excel document	S3IPF.PDS.008, i3r4 – 09/10/2017
AD- 5	XML Schemas.zip – Zip file containing all the schemas used to represent the metadata	S3IPF PDS 009, i3r1 – 09/10/2017
AD- 6	Sentinel SAFE Control Book Volume 1 – Core Specifications	GAEL-P264-DOC-0001-01-01, i1r1, 05/06/2012
AD- 7	Auxiliary Data Format Specification – OLCI Level 1	S3IPF.PDS.007.1, i2r9 09/10/2017

1.3.2 Reference documents

The following reference documents contain information supporting this document.

ID	Document	Reference
RD- 1	CCSDS 661.0-B-0 XFDU structure and construction rules	Issue Sept. 2008
RD- 2	Product Data Format Specification - Level 0	S3IPF.PDS.001, i1r8, 09/10/2017
RD- 3	Sentinel 3 Level 0, Level 1a/b/c Products Definition Part 2: Optical Products. Volume 1: Introduction, Conventions, and Common Structures (SY-4)	S3-RS-ACR-SY-00001, i8r0, 30/01/2015
RD- 4	Sentinel-3 Level 0, Level 1a/b/c Products Definition Part 2: Optical Products Volume 2: OLCI L0, L1b Products (SY-4)	S3-RS-ACR-SY-00004, i8r1, 17/04/2015
RD- 5	Sentinel-3 Optical products and Algorithm Definition: OLCI Product Definition	S3-L2-SD-05-C-ACR-PD, i2r5A, 25/09/2012
RD- 6	Sentinel-3 Optical products and Algorithm Definition: OLCI Level 2 Input Output Data Description	S3-L2-SD-08-C-ACR-IODD, i2r11.A, 07/02/2014

1.4 Terms, Definitions and Abbreviated Terms

Terms, Definitions and Abbreviated Terms are identified in the common volume of the product format specifications in [AD- 2].

1.5 Intellectual property rights for specific parts this document

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Section	IPR/Document Reference
Section 4.2.1 and sub-sections	Document Title: Level 0, Level 1a/b/c Products Definition Part 2 : Optical Products Volume 1: Introduction, Conventions and Common Structures Document Reference: S3-RS-ACR-SY-00001 Issue: i6r1 Date: 22/07/2011
Section 4.2.2 and sub-sections	
Section 7.1.1.3 and sub-sections	Document Title: Sentinel-3 Level 0, Level 1a/b/c Products Definition Part 2: Optical Products Volume 2: OLCI L0, L1b Products (SY-4) Document Reference: S3-RS-ACR-SY-00004 Issue: i7r0 Date: 06/07/2012
Section 7.1.1.4 and sub-sections	
Section 7.2.1.3 and sub-sections	Document Title: Sentinel-3 Optical products and Algorithm Definition: OLCI Product Definition Document Reference: S3-L2-SD-05-C-ACR-PD Issue: i2r5.A Date: 25/09/2012
Section 7.2.1.4 and sub-sections	
Section 7.2.2.3 and sub-sections	
Section 7.2.2.4 and sub-sections	

2. OVERVIEW OF THE INSTRUMENT: OLCI

The products specified in this document refer to the processed data coming from the OLCI instrument on-board Sentinel 3 satellite.

OLCI (Ocean and Land Colour Instrument) is a medium resolution push-broom imaging spectrometer of MERIS heritage, flown on Envisat, but with a slightly modified observation geometry: the FOV (Field of View) is tilted towards the west ($\sim 12^\circ$ away from the sun), minimizing the sun-glint effect over the ocean and offering a wider effective swath (~ 1300 km, overall FOV of 68.5°). The sampling distance is 1.2 km over the open ocean and 0.3 km for coastal zone and land observations.

The FOV of OLCI is divided between five cameras on a common structure with the calibration assembly. Each camera has an optical grating to provide the minimum baseline of 16 spectral bands required by the mission together with the potential for optional bands for improved atmospheric corrections.

Each camera is constituted of a Scrambling Window Element to comply with the polarization requirement, a COS (Camera Optical Sub-assembly) for the spectral splitting of the different wavelengths, a FPA (Focal Plane Assembly) with a CCD for the signal detection and a VAM (Video Acquisition Module) for the monitoring of the analog signal. The optical sub-assembly of each camera includes its own grating and provides the 21 spectral bands required by the mission.

A calibration assembly, including a rotation wheel with five different functions for normal viewing, dark current, spectral and radiometric calibrations insure the calibration of the instrument.

OLCI is equipped with on-board calibration hardware based on Sun diffusers. There are 3 Sun diffusers: 2 "white" diffusers dedicated to radiometric calibration, and one including spectral reflectance features dedicated to spectral calibration:

The OLCI calibration is undertaken in the region of the orbit between the observation phase and the eclipse period. Each calibration sequence begins with a dark current evaluation.

3. PRODUCT OVERVIEW

A graphical representation of the product tree for OLCI instrument is provided in Figure 3-1.

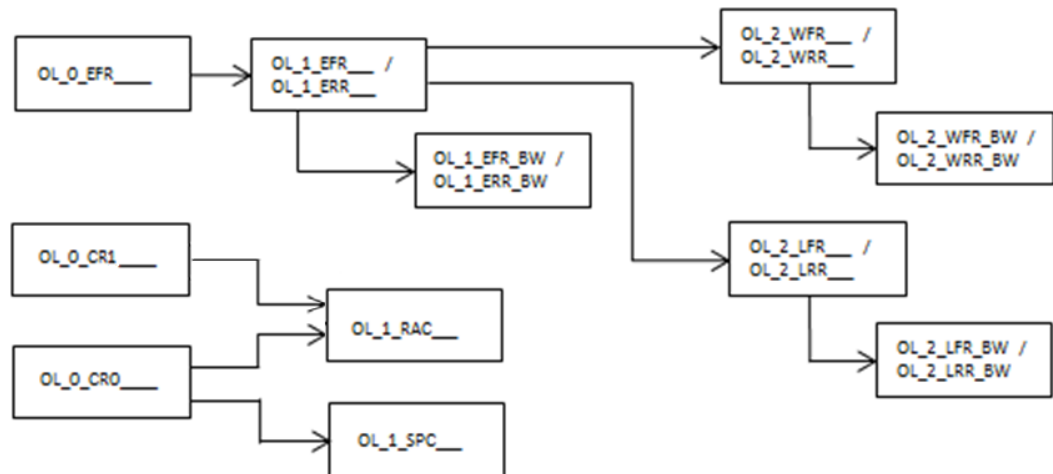


Figure 3-1: OLCI Product Tree

3.1 Product Tree

3.1.1 Science Products Tree

The S-3 OLCI products are summarized in Table 3-1:

Product type	Description	Level
OL_1_EFR___	Full Resolution top of atmosphere radiance	Level 1
OL_1_ERR___	Reduced Resolution top of atmosphere radiance	Level 1
OL_1_RAC___	Dark offset and gain coefficients from radiometric calibration	Level 1
OL_1_SPC___	Wavelength characterization from spectral calibration	Level 1
OL_2_WFR___	Full Resolution Water & Atmosphere geophysical products	Level 2 Marine
OL_2_LFR___	Full Resolution Land & Atmosphere geophysical products	Level 2 Land
OL_2_WRR___	Reduced Resolution Water & Atmosphere geophysical products	Level 2 Marine
OL_2_LRR___	Reduced Resolution Land & Atmosphere geophysical products	Level 2 Land

Table 3-1: OLCI products tree

3.1.2 Browse Products Tree

Browse Products are meant to support the user in the analysis of quality and suitability of the optical products only.

The OLCI Browse Products Tree is the following:

Product type	Description	Main Product	Subsampled Parameters
OL_1_EFR_BW	Quick Look of Full Resolution top of atmosphere	OL_1_EFR___	FR radiances
OL_1_ERR_BW	Quick Look of Reduced Resolution top of atmosphere	OL_1_ERR___	RR radiances
OL_2_WFR_BW	Quick Look of Full Resolution Water & Atmosphere geophysical products	OL_2_WFR___	<ul style="list-style-type: none"> • Total Backscattering coefficient • Total Absorption coefficient • Phytoplankton absorption coefficient • Algal Pigment Concentration • Total Suspended Matter Concentration
OL_2_WRR_BW	Quick Look of Reduced Resolution Water & Atmosphere geophysical products	OL_2_WRR___	<ul style="list-style-type: none"> • Total Backscattering coefficient • Total Absorption coefficient • Phytoplankton absorption coefficient • Algal Pigment Concentration • Total Suspended Matter Concentration
OL_2_LFR_BW	Quick Look of Full Resolution Land & Atmosphere geophysical products	OL_2_LFR___	<ul style="list-style-type: none"> • Green instantaneous FAPAR • Terrestrial Chlorophyll Index
OL_2_LRR_BW	Quick Look of Reduced Resolution Land & Atmosphere geophysical products	OL_2_LRR___	<ul style="list-style-type: none"> • Green instantaneous FAPAR • Terrestrial Chlorophyll Index

Table 3-2: OLCI Browse Products Tree

3.2 Product Naming Convention

The names of the OLCI products comply with the Sentinel 3 file naming convention, according to [AD- 1].

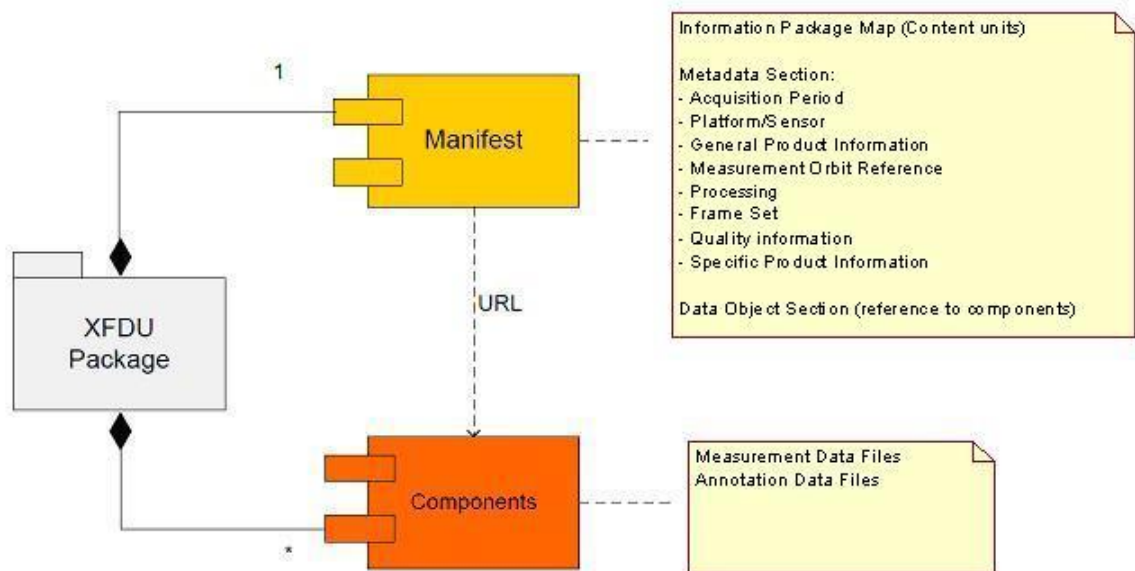
4. OLCI PRODUCT FORMAT SPECIFICATION: COMMON PART

4.1 General Product Structure

4.1.1 Package Layout

The format of every Sentinel 3 product is described in [AD- 2]. The Product Package is sketched in Figure 4-1.

Figure 4-1: XFDU package



In the following sections, the physical composition of each package is specified for the OLCI instrument.

The components of the package that are not part of the current operational production baseline are identified with a flag in the column N.O. (Not Operational). These components might be required to be generated at a later time during the mission lifecycle.

4.1.2 Manifest file

The manifest file is a set of metadata information related to the description of the product. It includes a common structure section, called primary metadata, and a specific section called secondary metadata.

4.1.2.1 Primary Metadata

The primary metadata is contained in various wrapped metadata units within the Sentinel-SAFE manifest: "acquisitionPeriod", "platform", "generalProductInformation", "orbitReference", "processing", "qualityInformation", "frameSet", and "olciProductInformation". The fields are described in [AD- 5].

4.1.2.2 Secondary Metadata

The secondary metadata section contains the information specific to the instrument, level or mode applied during the processing. The fields are described in [AD- 5].

4.1.3 Measurement Data Files and Annotation Data Files

The format of the measurement and annotation data files is NetCDF 4.

A NetCDF file contains dimensions, variables, and attributes, which all have both a name by which they are identified. These components can be used together to capture the meaning of data and relations among data fields in an array-oriented data set.

The global attributes defined for each netCDF file composing the products are fully defined in the common volume of the product data format specification documents named "Product structures" and referenced as [AD- 2].

4.1.3.1 Common additional global attributes

Additional global attributes common to all OLCI files are specifically defined. These attributes aims to ensure the self-containment of the dataset. There are defined in the following table and their value should be adapted according to the file.

Element name	Description	T	D
absolute_orbit_number	Absolute orbit number during which data contained within the product have been acquired	u32	1
start_time	Product start date and time (yyyy-mm-ddThh:mm:ss.ssssssZ)	S	1
stop_time	Product stop date and time (yyyy-mm-ddThh:mm:ss.ssssssZ)	S	1
comment	Miscellaneous extra information (empty)	S	1
resolution	Dataset resolution (across- and along-track) in meters unit function of the associated grid and view (except in Calibration modes)	S	1
ac_subsampling_factor	Across-track FR product pixel to Tie-point subsampling factor (except in Calibration modes)	i16	1
al_subsampling_factor	Along-track FR product pixel to Tie-point subsampling factor (except in Calibration modes)	i16	1

Table 3: Additional global attributes common to OLCI L1 and L2 products

4.2 Earth Observation Products

4.2.1 Common Measurement Files

The following file is common to both LAND and WATER Level 2 products.

4.2.1.1 Integrated Water Vapour

Element name	Description	Range or value	T	D
rows	Number of rows in the product image			
columns	Number of columns in the product image	FR: 4865 RR: 1217		
<common global attributes>	Common global attributes (including additional as defined in 4.1.3.1)			
IWV	Integrated water vapour column above the current pixel		uc	rows columns
units	UDUNITS unit name	kg.m-2		1
_FillValue	Value indicating missing data	255		1
scale_factor	Scaling factor used in decoding packed data			1
add_offset	Offset used to in decoding packed data			1
IWV_unc	Uncertainty estimate for the Integrated water vapour column above the current pixel		uc	rows columns
units	UDUNITS unit name	kg.m-2		1
_FillValue	Value indicating missing data	255		1
scale_factor	Scaling factor used in decoding packed data			1
add_offset	Offset used to in decoding packed data			1

Table 4-4: OL_2_WFR___/OL_2_WRR___/ OL_2_LFR___/OL_2_LRR IWV description

4.2.2 Common Annotation Files

In the following sections, the content of the common ADS (annotation datasets) is detailed.

4.2.2.1 Time Coordinates

Element name	Description	Range or value	T	D
rows	Number of rows in the product image			
<common global attributes>	Common global attributes (including additional as defined in 4.1.3.1)		st	1
time_stamp	Measurement Time Stamp for each line of the product		sll	rows
standard_name	CF Standard name	time		1
units	UDUNITS unit name	"microseconds since 2000-01-01 00:00:00"		1
_FillValue	Default value for missing data	-1		

Table 4-5: Time annotation data file description

4.2.2.2 Geo Coordinates

Element name	Description	Range or value	T	D
rows	Number of rows in the product image			
columns	Number of columns in the product image	FR: 4865 RR: 1217		
<common global attributes>	Common global attributes (including additional as defined in 4.1.3.1)			
longitude	DEM corrected longitude]-180; 180]	sl	rows columns
standard_name	CF Standard name	longitude		1
units	UDUNITS unit name	degrees_east		1
scale_factor	Value to be multiplied to packed data to unpack it	1.e-6		1
latitude	DEM corrected geodetic latitude	[-90; 90]	sl	rows columns
standard_name	CF Standard name	latitude		1
units	UDUNITS unit name	degrees_north		1
scale_factor	Value to be multiplied to packed data to unpack it	1.e-6		1
altitude	Surface elevation above reference ellipsoid	[-1000; 9000]	ss	rows columns
standard_name	CF Standard name	altitude		1
units	UDUNITS unit name	m		1

Table 4-6: Geo coordinates annotation data file description

4.2.2.3 Geo Coordinates Tie-Points

Element name	Description	Range or value	T	D
tie_rows	Number of tie point rows in the product			
tie_columns	Number of tie point columns in the product	77		
<common global attributes>	Common global attributes (including additional as defined in 4.1.3.1)			
longitude	longitude at tie points]-180; 180]	sl	tie_rows tie_columns
standard_name	CF Standard name	longitude		1
units	UDUNITS unit name	degrees_east		1
scale_factor	Value to be multiplied to packed data to unpack it	1.e-6		1
latitude	Geodetic latitude at tie points	[-90; 90]	sl	tie_rows tie_columns
standard_name	CF Standard name	latitude		1
units	UDUNITS unit name	degrees_north		1
scale_factor	Value to be multiplied to packed data to unpack it	1.e-6		1

Table 4-7: Geo coordinates tie points annotation data file description

4.2.2.4 Geometries Tie-Points

Element name	Description	Range or value	T	D
tie_rows	Number of tie point rows in the product			
tie_columns	Number of tie point columns in the product	77		
<common global attributes>	Common global attributes (including additional as defined in 4.1.3.1)			
SZA	Sun Zenith Angle at tie points	[0; 180]	ul	tie_rows tie_columns
units	UDUNITS unit name	degrees		1
scale_factor	Value to be multiplied to packed data to unpack it	1.e-6		1
coordinates	List of auxiliary coordinates variables related to the variable	latitude longitude		
SAA	Sun Azimuth Angle at tie points]-180; 180]	sl	tie_rows tie_columns
units	UDUNITS unit name	degrees		1
scale_factor	Value to be multiplied to packed data to unpack it	1.e-6		1
coordinates	List of auxiliary coordinates variables related to the variable	latitude longitude		
OZA	Observation (Viewing) Zenith Angle at tie points	[0; 180]	ul	tie_rows tie_columns
units	UDUNITS unit name	degrees		1
scale_factor	Value to be multiplied to packed data to unpack it	1.e-6		1
coordinates	List of auxiliary coordinates variables related to the variable	latitude longitude		
OAA	Observation (Viewing) Azimuth Angle at tie points]-180; 180]	sl	tie_rows tie_columns
units	UDUNITS unit name	degrees		1
scale_factor	Value to be multiplied to packed data to unpack it	1.e-6		1
coordinates	List of auxiliary coordinates variables related to the variable	latitude longitude		

Table 4-8: Geometries tie points annotation data file description

4.2.2.5 Meteorology Tie-Points

Element name	Description	Range or value	T	D
tie_rows	Number of tie point rows in the product			
tie_columns	Number of tie point columns in the product	77		
tie_pressure_levels	Number of pressure levels in the temperature profile provided at Tie Points	25		
wind_vectors	Dimensions for wind vector	2		
<common global attributes>	Common global attributes (including additional as defined in 4.1.3.1)			
horizontal_wind	Horizontal wind vector at 10m altitude	[-100; 100]	fl	tie_rows tie_columns wind_vectors
units	UDUNITS unit name	m.s-1		1
_FillValue	Default value for missing data	9.96921e36		
coordinates	List of auxiliary coordinates variables related to the variable	latitude longitude		1
sea_level_pressure	Mean sea level pressure	[0; 1500]	fl	tie_rows tie_columns
standard_name	CF Standard name	"air_pressure_at_sea_level"		1
units	UDUNITS unit name	hPa		1
_FillValue	Default value for missing data	-1		
coordinates	List of auxiliary coordinates variables related to the variable	latitude longitude		1
total_ozone	Total columnar ozone	[0; 100]	fl	tie_rows tie_columns
standard_name	CF Standard name	"atmosphere_mass_content_of_ozone"		1
units	UDUNITS unit name	Kg.m-2		1
_FillValue	Default value for missing data	-1		
coordinates	List of auxiliary coordinates variables related to the variable	latitude longitude		1

Element name	Description	Range or value	T	D
humidity	Relative humidity	[0; 100]	fl	tie_rows tie_columns
standard_name	CF Standard name	"relative_humidity"		1
units	UDUNITS unit name	%		1
_FillValue	Default value for missing data	-1		
coordinates	List of auxiliary coordinates variables related to the variable	latitude longitude		1
reference_pressure_level	Reference pressure levels	[0; 1500]	fl	tie_pressure_levels
standard_name	CF Standard name	"air_pressure"		1
units	UDUNITS unit name	hPa		1
_FillValue	Default value for missing data	-1		
coordinates	List of auxiliary coordinates variables related to the variable	latitude longitude		1
atmospheric_temperature_profile	Atmospheric temperature profile	[0; 400]	fl	tie_rows tie_columns tie_pressure_levels
standard_name	CF Standard name	"air_temperature"		1
units	UDUNITS unit name	K		1
_FillValue	Default value for missing data	-1		
coordinates	List of auxiliary coordinates variables related to the variable	latitude longitude		1
ancillary_variables	List of variables that are closely associated to this data	reference_pressure_level		1
total_column_water_vapour	Total column water vapor	[0; 100]	fl	tie_rows tie_columns
standard_name	CF Standard name	"atmosphere_water_vapor_content"		1
units	UDUNITS unit name	Kg.m-2		1
_FillValue	Default value for missing data	-1		
coordinates	List of auxiliary coordinates variables related to the variable	latitude longitude		1

Table 4-9: Meteorological tie points annotation data file description

Note: The atmospheric_temperature_profile variable is a 3 dimensional array. Information is provided at the tie point position and at different altitudes defined by pressure levels. Those levels are defined through the variable "reference pressure level"

4.2.2.6 Instrument Data

Element name	Description	Range or value	T	D
rows	Number of rows in the product			
columns	Number of columns in the product	FR: 4865 RR: 1217		
bands	Number of OLCI acquisition bands	21		
detectors	Number of detectors	3700		
<common global attributes>	Common global attributes (including additional as defined in 4.1.3.1)			
detector_index	Detector index	[0; 3699]	ss	rows columns
_FillValue	Default value for missing data	-1		1
frame_offset	Re-sampling along-track frame offset	[-15; 15]	ss	detectors
ancillary_variables	List of variables that are closely associated to this data	"detector_index"		
lambda0	OLCI pixels characterized central wavelength	[390; 1040]	fl	bands detectors
units	UDUNITS unit name	nm		1
_FillValue	Default value for missing data	-1		1
ancillary_variables	List of variables that are closely associated to this data	"detector_index FWHM"		
FWHM	OLCI bandwidths (Full Widths at Half Maximum)	[0; 650]	fl	bands detectors
units	UDUNITS unit name	nm		1
_FillValue	Default value for missing data	-1		1
ancillary_variables	List of variables that are closely associated to this data	"detector_index lambda0"		
solar_flux	In-band solar irradiance, seasonally corrected.	[500; 2500]	fl	bands detectors
units	UDUNITS unit name	mW.m-2.nm-1		1
_FillValue	Default value for missing data	-1		1
ancillary_variables	List of variables that are closely associated to this data	"detector_index lambda0"		

Element name	Description	Range or value	T	D
relative_spectral_covariance	Relative spectral covariance matrix		fl	bands bands
ancillary_variables	List of variables that are closely associated to this data	"detector_index lambda0"		

Table 4-10: Instrument data annotation data file description

5. MANIFEST FILE DESCRIPTION: COMMON PART

The purpose of this section is to describe in detail all the data sets that are included with any of the Sentinel-3 OLCI product. Most of the description are common to all products and are therefore described in [AD- 2].

Only the common parts are detailed in this section.

5.1 Metadata Section

See [AD- 2] for the metadata general description.

5.2 Data Object Section

The data object section of the manifest includes one data object per data object pointer. Each data object pointer is identified with its dataObjectID as defined in the dedicated information package map.

5.2.1 Common annotation Data Files

Each common annotations Data File constitutes a Data Object composed as follows:

Name		Description	Data type	Occ.	Value
Data Object		This element references the Data Component included in the product.	U	1..*	
	ID	Data Component ID	S	1	"timeCoordinatesData"
	byte Stream	Pointer to the data Component	U	1..*	
	ID	Byte stream ID	S	0..1	
	mimeType	MIME type for the referenced Data Component	E	1	"application/x-netcdf"
	size	Size of the Data Object File	L	1	

Name				Description	Data type	Occ.	Value
		fileLocation		Description of the location of the Data component file	U	1	
			locator Type	Type of the file location	URL	0..1	URL
			href	Relative path of the file (in the file system) containing the referenced Data Component	S		"time_coordinates.nc"
			textInfo	Textual description of the Data Component	S	0..1	
		checksum		Checksum for the Data Component	U	1	
			checksumName		E	1	MD5

Table 5-1: Time coordinates Metadata Object

Name			Description	Data type	Occ.	Value
Data Object			This element references the Data Component included in the product.	U	1..*	
	ID		Data Component ID	S	1	“geoCoordinatesData”
	byte Stream		Pointer to the Data Component	U	1..*	
		ID	Byte stream ID	S	0..1	
		contentType	MIME type for the referenced Data Component	E	1	"application/x-netcdf"
		size	Size of the Data Object File	L	1	
		fileLocation	Description of the location of the Data component file	U	1	
		locator Type	Type of the file location	URL	0..1	URL
		href	Relative path of the file (in the file system) containing the referenced Data Component	S		“geo_coordinates.nc”
		textInfo	Textual description of the Data Component	S	0..1	
		checksum	Checksum for the Data Component	U	1	
		checksumName		E	1	MD5

Table 5-2: Geo-coordinates Metadata Object

Name				Description	Data type	Occ.	Value
Data Object				This element references the Data Component included in the product.	U	1..*	
	ID			Data Component ID	S	1	"tieGeoCoordinatesData"
	byte Stream			Pointer to the Data Component	U	1..*	
		ID		Byte stream ID	S	0..1	
		mimeType		MIME type for the referenced Data Component	E	1	"application/x-netcdf"
		size		Size of the Data Object File	L	1	
		fileLocation		Description of the location of the Data component file	U	1	
			locator Type	Type of the file location	URL	0..1	URL
			href	Relative path of the file (in the file system) containing the referenced Data Component	S		"tie_geo_coordinates.nc"
			textInfo	Textual description of the Data Component	S	0..1	
		checksum		Checksum for the Data Component	U	1	
			checksumName		E	1	MD5

Table 5-3: Tie geo-coordinates Metadata Object

Name				Description	Data type	Occ.	Value
Data Object				This element references the Data Component included in the product.	U	1..*	
	ID			Data Component ID	S	1	"tieGeometriesData"
	byte Stream			Pointer to the Data Component	U	1..*	
		ID		Byte stream ID	S	0..1	
		mimeType		MIME type for the referenced Data Component	E	1	"application/x-netcdf"
		size		Size of the Data Object File	L	1	
		fileLocation		Description of the location of the Data component file	U	1	
			locator Type	Type of the file location	URL	0..1	URL
			href	Relative path of the file (in the file system) containing the referenced Data Component	S		"tie_geometries.nc"
			textInfo	Textual description of the Data Component	S	0..1	
		checksum		Checksum for the Data Component	U	1	
			checksumName		E	1	MD5

Table 5-4: Tie geometries Metadata Object

Name				Description	Data type	Occ.	Value
Data Object				This element references the Data Component included in the product.	U	1..*	
	ID			Data Component ID	S	1	"tieMeteoData"
	byte Stream			Pointer to the Data Component	U	1..*	
		ID		Byte stream ID	S	0..1	
		mimeType		MIME type for the referenced Data Component	E	1	"application/x-netcdf"
		size		Size of the Data Object File	L	1	
		fileLocation		Description of the location of the Data component file	U	1	
			locator Type	Type of the file location	URL	0..1	URL
			href	Relative path of the file (in the file system) containing the referenced Data Component	S		"tie_meteo.nc"
			textInfo	Textual description of the Data Component	S	0..1	
		checksum		Checksum for the Data Component	U	1	
			checksumName		E	1	MD5

Table 5-5: Tie meteo Metadata Object

Name				Description	Data type	Occ.	Value
Data Object				This element references the Data Component included in the product.	U	1..*	
	ID			Data Component ID	S	1	"instrumentDataData"
	byte Stream			Pointer to the Data Component	U	1..*	
		ID		Byte stream ID	S	0..1	
		mimeType		MIME type for the referenced Data Component	E	1	"application/x-netcdf"
		size		Size of the Data Object File	L	1	
		fileLocation		Description of the location of the Data component file	U	1	
			locator Type	Type of the file location	URL	0..1	URL
			href	Relative path of the file (in the file system) containing the referenced Data Component	S		"instrument_data.nc"
			textInfo	Textual description of the Data Component	S	0..1	
		checksum		Checksum for the Data Component	U	1	
			checksumName		E	1	MD5

Table 5-6: Instrument data Metadata Object

Name			Description	Data type	Occ.	Value
Data Object			This element references the Data Component included in the product.	U	1..*	
	ID		Data Component ID	S	1	“OLQCReport”
	byte Stream		Pointer to the Data Component	U	1..*	
		ID	Byte stream ID	S	0..1	
		contentType	MIME type for the referenced Data Component	E	1	"application/octetstream"
		size	Size of the Data Object File	L	1	
		fileLocation	Description of the location of the data component file	U	1	
			locator Type	URL	0..1	URL
			href	S		TBD
			textInfo	S	0..1	“On Line Quality Control Report”
		checksum	Checksum for the Data Component	U	1	
			checksumName	E	1	MD5

Table 5-73: OLQC annotation Metadata Object

6. XML SCHEMA

The xml schemas used to generate the product manifest are provided as separate files (see AD- 6).

7. OLCI PRODUCT FORMAT SPECIFICATION

7.1 Earth Observation Products

7.1.1 Level 1 Products: OL_1_EFR___/OL_1_ERR___

7.1.1.1 Package Description

An “OL_1_EFR___” product is composed of 43 measurement data files: 21 files containing radiances at each band (one band per file), **optionally 21 files containing the associated radiometric uncertainty estimates (one band per file)**, plus an additional file providing all data related to pixels that have been removed during the re-sampling process, **including their uncertainty estimates**.

The “OL_1_ERR___” product contains the same files except the one related to removed pixels.

7.1.1.1.1 OL_1_EFR___ product summary

Product Package Type OL_1_EFR___		Description OLCI Level 1 full resolution product			
Product Level	Diss. Timeliness	Product Category	Application Domain		Spatial Resolution
1	NRT NTC	Available to the user	LND	MRT	300m
Product Dissemination Unit Frame		Number of Package components	Number of Measurement Data Files	Number of Annotation Data Files	Number of Representation Information Files
		31 ¹	22	7	0
Product Package Structure					
Manifest file (see section 7.1.1.2 and 8 for more details)					
File name			Composition		
xfdumanifest.xml			XML fields		
Measurement Data files (see section 7.1.1.3 for more details)					
File name			Composition		N.O.
Oa01_radiance.nc			Oa01_radiance		
Oa02_radiance.nc			Oa02_radiance		

¹ Number of Package components includes the manifest and the OLQC Report.

... continue	... continue	
Oa21_radiance.nc	Oa21_radiance	
Oa01_radiance_unc.nc	Oa01_radiance_unc	
Oa02_radiance_unc.nc	Oa02_radiance_unc	
... continue	... continue	
Oa21_radiance_unc.nc	Oa21_radiance_unc	
removed_pixels.nc	Oa01_radiance, Oa01_radiance_unc, Oa02_radiance, Oa02_radiance_unc ... Oa21_radiance, Oa21_radiance_unc, Longitude, latitude, ...	
Annotation Data files (see 4.2.2 and section 7.1.1.4 for more details)		N.O
File name	Composition	
time_coordinates.nc	time_stamp	
geo_coordinates.nc	longitude, latitude and altitude	
qualityFlags.nc	quality_flags	
tie_geo_coordinates.nc	longitude, latitude	
tie_geometries.nc	SZA, SAA, OZA, OAA	
tie_meteo.nc	horizontal_wind, sea_level_pressure, total_ozone, humidity, reference_pressure_level, atmospheric_temperature_profile, total_columnar_water_vapour	
instrument_data.nc	lambda0, FWHM, Solar Flux, detector_index, frame_offset, relative_spectral_covariance	
Representation Information Files		N.O
File name	Composition	
none		

Table 7-1: OLCI Full Resolution Level 1 product physical composition

7.1.1.1.2 OL_1_ERR__ product summary

Product Package Type		Description		
OL_1_ERR		OLCI Level 1 reduced resolution product		
Product Level	Diss. Timeliness	Product Category	Application Domain	Spatial Resolution
1	NRT NTC	Available to the user	LND MRT	1000m

Product Dissemination Unit Frame	Number of Package components	Number of Measurement Data Files	Number of Annotation Data Files	Number of Representation Information Files
	29	21	7	0
Product Package Structure				
Manifest file (see section 7.1.1.2 and 8 for more details)				
File name	Composition			
xfdumanifest.xml	XML fields			
Measurement Data files (see section 7.1.1.3 for more details)				
File name	Composition			N.O
Oa01_radiance.nc	Oa01_radiance			
Oa02_radiance.nc	Oa02_radiance			
... continue	... continue			
Oa21_radiance.nc	Oa21_radiance			
Oa01_radiance_unc.nc	Oa01_radiance_unc			
Oa02_radiance_unc.nc	Oa02_radiance_unc			
... continue	... continue			
Oa21_radiance_unc.nc	Oa21_radiance_unc			
Annotation Data files (see 4.2.2 and section 7.1.1.4 for more details)				
				N.O
File name	Composition			
time_coordinates.nc	time_stamp			
geo_coordinates.nc	longitude, latitude and altitude			
qualityFlags.nc	quality_flags			
tie_geo_coordinates.nc	longitude, latitude			
tie_geometries.nc	SZA, SAA, OZA, OAA			
tie_meteo.nc	horizontal_wind, sea_level_pressure, total_ozone, humidity, reference_pressure_level, atmospheric_temperature_profile, total_columnar_water_vapour			
instrument_data.nc	lambda0, FWHM, Solar Flux, detector_index, frame_offset, relative_spectral_covariance			
Representation Information Files				
				N.O
File name	Composition			
none				

Table 7-2: OLCI Reduced Resolution Level 1 product physical composition

7.1.1.2 Manifest File

The structure of the Manifest element is described in [AD- 2].

7.1.1.2.1 Wrapped Metadata

According to [AD- 2], Wrapped Metadata are grouped in Primary Metadata, common to all Sentinel 3 products and Secondary Metadata, specific for instrument and processing level.

Primary Metadata are described in [AD- 2].

Secondary Metadata for the OLCI instrument are reported in Table 7-3. Last columns of the table indicate the applicability of Metadata fields to the processing Level.

*< Complete secondary metadata is described in details in [AD- 4].
 The content of this table will be embedded in the document when it will be finalized >*

Table 7-3: Secondary Metadata for OLCI products

7.1.1.3 Measurement Data Files

7.1.1.3.1 Radiance: Oa##_radiance.nc

Each radiance file is composed of TOA radiances at the band Oa## on the product grid.

Element name	Description	Range or value	T	D
rows	Number of rows in the product image			
Columns	Number of columns in the product image	FR: 4865 RR: 1217		
<common global attributes>	Common global attributes (including additional as defined in 4.1.3.1)			
Oa##_radiance	TOA radiance for OLCI acquisition band ##	[0, 2 ¹⁶ – 2]	us	rows columns
standard_name	CF standard name	TOA_upwelling_spectral_radiance		1
units	UDUNITS unit name	mW.m-2.sr-1.nm-1		1
_FillValue	Value indicating missing data	2 ¹⁶ – 1		1
scale_factor	Scaling factor used in decoding packed data			1

Element name	Description	Range or value	T	D
add_offset	Offset used to in decoding packed data			1
ancillary_variables	List of variables that are closely associated to this data	Oa##_radiance_unc		1
coordinates	List of auxiliary coordinates variables related to the variable	time_stamp altitude latitude longitude		

Table 7-4: OL_1_EFR___/OL_1_ERR___: radiance Oa## description

7.1.1.3.2 Radiance Uncertainty: Oa##_radiance_unc.nc

Each radiance uncertainty file is composed of TOA radiance uncertainties at the band Oa## on the product grid.

Element name	Description	Range or value	T	D
Rows	Number of rows in the product image			
Columns	Number of columns in the product image	FR: 4865 RR: 1217		
<common global attributes>	Common global attributes (including additional as defined in 4.1.3.1)			
Oa##_radiance_unc	log10 scaled Radiometric Uncertainty Estimate for OLCI acquisition band ##	[0, 254]	uc	rows columns
units	UDUNITS unit name	mW.m-2.sr-1.nm-1		1
_FillValue	Value indicating missing data	255		1
scale_factor	Scaling factor used in decoding packed data			1
add_offset	Offset used to in decoding packed data			1
coordinates	List of auxiliary coordinates variables related to the variable	time_stamp altitude latitude longitude		1

Table 7-5: OL_1_EFR___/OL_1_ERR___: radiance uncertainty Oa## description

7.1.1.3.3 Removed Pixels: removed_pixels.nc

This file gathers all removed pixels corresponding to the pixels located within camera's overlaps and that have been removed from the gridded Level 1b product during the resampling process. This file is not present in the reduced resolution product.

Element name	Description	Range or value	T	D
rows	Number of rows in the product image			

Element name	Description	Range or value	T	D
removed_pixels	Maximum removed pixels per line	~125		
<common global attributes>	Common global attributes (including additional as defined in 4.1.3.1)		S	1
nb_removed_pixels	Number removed pixels per frame		us	rows
Oa##_radiance	Radiance for removed pixels for OLCI acquisition band ##	[0, 2 ¹⁶ – 2]	us	rows removed_pixels
standard_name	CF standard name	TOA_upwelling_spectral_radiance		1
units	UDUNITS unit name	mW.m-2.sr-1.nm-1		1
_FillValue	Value indicating missing data	2 ¹⁶ – 1		1
scale_factor	Scaling factor used in decoding packed data		fl	1
add_offset	Offset used to in decoding packed data		fl	1
ancillary_variables	List of variables that are closely associated to this data	Oa##_radiance_unc		1
coordinates	List of auxiliary coordinates variables related to the variable	time_stamp altitude latitude longitude		
Oa##_radiance_unc	log10 scaled Radiometric Uncertainty Estimate for removed pixels for OLCI acquisition band ##	[0, 254]	uc	rows removed_pixels
units	UDUNITS unit name	mW.m-2.sr-1.nm-1		1
_FillValue	Value indicating missing data	255		1
scale_factor	Scaling factor used in decoding packed data		fl	1
add_offset	Offset used to in decoding packed data		fl	1
coordinates	List of auxiliary coordinates variables related to the variable	time_stamp altitude latitude longitude		
latitude	Latitudes for removed pixels	[-90; 90]	sl	rows removed_pixels
standard_name	CF standard name	latitude		1
units	UDUNITS unit name	degrees_north		1
_FillValue	Value indicating missing data	-2147483647		1
scale_factor	Scaling factor used in decoding packed data	1e-6	fl	1
longitude	Longitudes for removed pixels]-180;1 80]	sl	rows removed_pixels

Element name	Description	Range or value	T	D
standard_name	CF standard name	longitude		1
units	UDUNITS unit name	degrees_east		1
_FillValue	Value indicating missing data	-2147483647		1
scale_factor	Scaling factor used in decoding packed data	1e-6	fl	1
altitude	Altitudes for removed pixels	[-1000; 9000]	ss	rows removed_pixels
standard_name	CF standard name	altitude		1
units	UDUNITS unit name	mW.m-2.sr-1.nm-1		1
_FillValue	Value indicating missing data	-32767		1
SZA	Sun Zenith Angle for removed pixels	[0; 180]	ul	rows removed_pixels
units	UDUNITS unit name	degrees		1
_FillValue	Value indicating missing data	4294967295		1
scale_factor	Scaling factor used in decoding packed data		fl	1
coordinates	List of auxiliary coordinates variables related to the variable	time_stamp altitude latitude longitude		
detector_index	Detector indices for removed pixels	[-1; 3699]	ss	rows removed_pixels
_FillValue	Value indicating missing data	-1		1
coordinates	List of auxiliary coordinates variables related to the variable	time_stamp altitude latitude longitude		
quality_flags	Classification and quality flags for removed pixels		ul	rows removed_pixels
flag_masks	List of bit fields describing boolean or enumerated flags	See Table 7-9	ul	31
flag_meanings	List of flag meanings composing this variable	See Table 7-9	st	31
coordinates	List of auxiliary coordinates variables related to the variable	time_stamp altitude latitude longitude		

Table 7-6: OL_1_EFR____: removed pixel description

7.1.1.4 Annotation Data Files

7.1.1.4.1 Quality Flags: qualityFlags.nc

This file contains classification and quality flags for each pixel. It comprises the following flags:

- Land/ saline water mask (based on a priori knowledge),
- Fresh inland water mask (based on a priori knowledge),
- Tidal regions mask (based on a priori knowledge),
- Coastline mask (based on a priori knowledge),
- Preliminary Cloud mask (bright pixels),
- Identification of pixels not corrected for the straylight
- Identification of invalid pixels,
- Identification of pixels where sun glint might occurs (computed in function of the viewing and sun geometries as well as the wind conditions at water surface,
- Identification of saturated samples
- Identification of “dubious” samples or pixels of potentially lower quality,
- Identification of cosmetic pixels (containing at least one sample filled with cosmetic data),
- Identification of duplicated pixels (as a consequence of the re-sampling process on an even product grid)

Element name	Description	Range or value	T	D
rows	Number of rows in the product image			
columns	Number of columns in the product image	FR: 4865 RR: 1217		
<common global attributes>	Common global attributes (including additional as defined in 4.1.3.1)		st	1
quality_flags	Classification and quality flags		ul	rows columns
flag_masks	List of bit fields describing boolean or enumerated flags	See Table 7-9	ul	31
flag_meanings	List of flag meanings composing this variable	See Table 7-9	st	1
coordinates	List of auxiliary coordinates variables related to the variable	time_stamp altitude latitude longitude		

Table 7-7: OL_1_EFR___/OL_1_ERR___: quality flags annotation data file description

Description of the structure of the 4 bytes regrouping all Classification and Quality flags of the L1b products is given in the table below (see the conventions detailed in volume 1 for the ordering of the bytes and bits):

byte \ bit	7	6	5	4	3	2	1	0
3	A	B	C	D	E	F	G	H
2	I	J	K	L1	L2	L3	L4	L5
1	L6	L7	L8	L9	L10	L11	L12	L13
0	L14	L15	L16	L17	L18	L19	L20	L21

Table 7-8 – Detailed structure of the quality flags variable

With:

- **A: Land / saline Water flag** set to '1' if the pixel is over land, '0' if it is over water.
- **B: Coastline flag** set to '1' if the pixel is on coastline
- **C: Fresh Inland Water flag** set to '1' if the pixel is over fresh water rivers or lakes
- **D: Tidal regions flag** set to '1' if the pixel is over a tidal region
- **E: Preliminary Cloud flag** (bright pixel) set to '1' if the pixel is bright
- **F: “StrayLightRisk” Pixel flag** set to '1' if stray light correction (of the Ground Imager) quality is degraded because not enough neighbour pixels were available for its estimation.
- **G: Invalid Pixel flag** set to '1' if the pixel is invalid, i.e. its value is missing either because out of the instrument swath or because of missing or unusable Level 0 data.
- **H: Cosmetic Pixel flag** set to '1' if the pixel has been filled with cosmetic values.
- **I: Duplicated Pixel flag** set to '1' if the pixel is derived from the same instrument pixel as one of its neighbour during the re-sampling process.
- **J: Sun-Glint Risk flag** set to '1' if the viewing and wind conditions are such that the Sun may cause glint to occur on pixels over water surfaces (This flag is set only on the basis of sun and viewing angles taking into account wind conditions, but it is not set according to radiometric data)

- **K: “Dubious” Pixel flag** set to ‘1’ if any pixel’s sample is potentially contaminated by a neighbour saturated sample or if the Instrument Source Packet it was extracted from is corrupted.
- **Li: Saturated Sample flag** set to ‘1’ if the sample of band Oi is saturated.
- **s:** spare bits, to be ignored (set to 0).

The list of values allowed for the flag_masks and flag_meanings attributes is detailed in the table below.

flag_masks	flag_meanings
80000000h	land ('0' = saline water)
40000000h	coastline
20000000h	fresh_inland_water
10000000h	tidal_region
08000000h	bright
04000000h	straylight_risk
02000000h	invalid
01000000h	cosmetic
00800000h	duplicated
00400000h	sun-glint_risk
00200000h	dubious
00100000h	saturated@Oa01
00080000h	saturated@Oa02
00040000h	saturated@Oa03
00020000h	saturated@Oa04
00010000h	saturated@Oa05
00008000h	saturated@Oa06

flag_masks	flag_meanings
00004000h	saturated@Oa07
00002000h	saturated@Oa08
00001000h	saturated@Oa09
00000800h	saturated@Oa10
00000400h	saturated@Oa11
00000200h	saturated@Oa12
00000100h	saturated@Oa13
00000080h	saturated@Oa14
00000040h	saturated@Oa15
00000020h	saturated@Oa16
00000010h	saturated@Oa17
00000008h	saturated@Oa18
00000004h	saturated@Oa19
00000002h	saturated@Oa20
00000001h	saturated@Oa21

Table 7-9 – List of allowed values to be taken by flags attributes

7.2 Calibration Products

7.2.1 Radiometric Calibration: OL_1_RAC____

7.2.1.1 Package Description

An “OL_1_RAC____” product is composed of 1 measurement and 1 annotation data files.

Additional global attributes for this product are provided in the next table:

Element name	Description	T	D
calibration_sequence_index	Calibration sequence ID	u16	1

Table 10: Additional Global Attributes for OLCI L1 files in RAC mode

7.2.1.1.1 OL_1_RAC____ product summary

Product Package Type OL_1_RAC____		Description OLCI calibration product containing dark offset and gain coefficients from radiometric calibration			
Product Level	Diss. Timeliness	Product Category	Application Domain	Spatial Resolution	
1	(NRT)	Not Available to the user			
Product Dissemination Unit N/A		Number of Package components	Number of Measurement Data Files	Number of Annotation Data Files	Number of Representation Information Files
		4 ²	1	1	0
Product Package Structure					
Manifest file file (see section 7.2.1.2 and 8 for more details)					
File name			Composition		
xfdumanifest.xml			Xml fields		
Measurement Data files (see section 7.2.1.3 for more details)					N.O
File name			Composition		

² Number of Package components includes the manifest and the OLQC Report.

radiometric_coef.nc	dark_offset_coefficients, dark_offset_coefficients_unc, dark_current_coefficients, dark_current_coefficients_unc, gain_coefficients, gain_coefficients_unc, shutter_mean_dark_pixels, diffuser_mean_dark_pixels, shutter_mean_blank_pixels, diffuser_mean_blank_pixels	
Annotation Data files (see section 7.2.1.4 for more details)		N.O
File name	Composition	
RC_annotations.nc	quality_flags, valid_DO_num, valid_DC_num, valid_G_num, shutter_CCD_temperature, diffuser_CCD_temperature, Sun_azimuth_angles, Sun_zenith_angles, Sun_angles_times	
Representation Information Files		N.O
File name	Composition	
none		

Table 7-11: OLCI Radiometric Calibration Level 1 product physical composition

7.2.1.1.2 Wrapped Metadata

According to [AD- 2], Wrapped Metadata are grouped in Primary Metadata, common to all Sentinel 3 products and Secondary Metadata, specific for instrument and processing level.

Primary Metadata are described in [AD- 2].

Secondary Metadata for the OLCI instrument are reported in Table 7-12 Last columns of the table indicate the applicability of Metadata fields to the processing Level.

*< Complete secondary metadata is described in details in [AD- 4].
The content of this table will be embedded in the document when it will be finalized >*

Table 7-12: Secondary Metadata for OLCI products

7.2.1.2 Manifest File

The structure of the Manifest element is described in [AD- 2].

7.2.1.3 Measurement Data Files

7.2.1.3.1 Radiometric Coefficients

Element name	Description	Range or value	T	D
detectors	Number of instrument detectors per frame (covering the five cameras)	3700		
bands	Number of OLCI bands, excluding the smear band	21		
bands_total	Number of OLCI bands, including the smear band	22		
dark_pixels	Number of dark pixels for the five OLCI cameras	50		
blank_pixels	Number of blank pixels for the five OLCI cameras	20		
<common global attributes>	Common global attributes (including additional as defined in 4.1.3.1)			
dark_offset_coefficients	Dark offset coefficients for all pixels	[0; 200]	fl	bands_total detectors
units	UDUNITS unit name	count		1
dark_offset_coefficients_unc	Dark offset coefficients uncertainty for all pixels	[0; 200]	fl	bands_total detectors
units	UDUNITS unit name	count		1
dark_current_coefficients	Dark current coefficients for all pixels	[0; 200]	fl	bands_total detectors
units	UDUNITS unit name	count		1
dark_current_coefficients_unc	Dark current coefficients uncertainty for all pixels	[0; 200]	fl	bands_total detectors
units	UDUNITS unit name	count		1
gain_coefficients ³	Gain coefficients for all pixels	[0; 1000]	fl	bands detectors

³ This variable may be left to _FillValue in case the processed radiometric calibration sequence does not contain any diffuser observation

Element name	Description	Range or value	T	D
units	UDUNITS unit name	mW-1.m2.sr.nm		1
_FillValue	Value indicating missing data	NaN	fl	1
gain_coefficients_unc³	Gain coefficients uncertainty for all pixels	[0; 1000]	fl	bands detectors
units	UDUNITS unit name	mW-1.m2.sr.nm		1
_FillValue	Value indicating missing data	NaN	fl	1
shutter_mean_dark_pixels	Time average of the dark pixels of the 5 cameras at the 21 nominal bands plus the smear band, all acquired in shutter position	[0; 200]	fl	bands_total dark_pixels
shutter_mean_blank_pixels	Time average of the blank pixels of the 5 cameras at the 21 nominal bands plus the smear band, all acquired in shutter position	[0; 200]	fl	bands_total blank_pixels
diffuser_mean_dark_pixels ³	Time average of the dark pixels of the 5 cameras at the 21 nominal bands plus the smear band, all acquired in diffuser position	[0; 200]	fl	bands_total dark_pixels
_FillValue	Value indicating missing data	NaN	fl	1
diffuser_mean_blank_pixels ³	Time average of the blank pixels of the 5 cameras at the 21 nominal bands plus the smear band, all acquired in diffuser position	[0; 200]	fl	bands_total blank_pixels
_FillValue	Value indicating missing data	NaN	fl	1

Table 7-13: OL_1_RAC___ radiometric_coef description

7.2.1.4 Annotation Data Files

7.2.1.4.1 Coefficients Annotation file

The Coefficients Annotations file contains:

- Quality Information for each instrument detector,
- Telemetry statistics providing the minimum, maximum, and mean values of measured temperatures for each sub-sequence of the calibration sequence (i.e. while the Calibration Mechanism (CM) is in shutter position, or while it is in diffuser position)

Element name	Description	Range or value	T	D
detectors	Number of instrument detectors per frame (covering the five cameras)	3700		

Element name	Description	Range or value	T	D
bands	Number of OLCI bands, excluding the smear band	21		
bands_total	Number of OLCI bands, including the smear band	22		
min_mean_max	Dimension of 3 to hold min/mean/max values	3		
modules	Number of camera modules	5		
<common global attributes>	Common global attributes (including additional as defined in 4.1.3.1)			1
quality_flags	Quality flags		uc	bands_total detectors
thresholds	Thresholds used to compute quality flags		us	3
avg_length	Vector of the two lengths of the average led to compute the dark offset and the gain coefficients, i.e. length of sub-sequences where CM is in shutter and in diffuser positions [shutter_nF diffuser_nF]		us	2
flag_masks	List of bit fields describing boolean or enumerated flags		uc	3
flag_meanings	List of flag meanings composing this variable		st	1
valid_DO_num	Number of valid microbands used for dark offset coefficient average	[0; 4]	us	bands_total detectors
valid_DC_num	Number of valid microbands used for dark current coefficient average	[0; 4]	us	bands_total detectors
valid_G_num	Number of valid frames used for gain coefficient average	[0; 536]	us	bands detectors
shutter_CCD_temperature	CCD temperature in shutter mode	[-100; 100]	fl	modules min_mean_max
units	UDUNITS unit name	C		1
diffuser_CCD_temperature³	CCD temperature in diffuser mode	[-100; 100]	fl	modules min_mean_max
units	UDUNITS unit name	C		1
_FillValue	Value indicating missing data	NaN	fl	1
Sun_azimuth_angles³	Sun azimuth angle (diffuser reference) at start, mid and end of exposure	[-180; 180]	db	start_mid_stop
units	UDUNITS unit name	degrees		1
_FillValue	Value indicating missing data	NaN	db	1
Sun_zenith_angles³	Sun azimuth angle (diffuser reference) at start, mid and end of exposure	[0; 90]	Db	start_mid_stop

Element name	Description	Range or value	T	D
units	UDUNITS unit name	degrees		1
_FillValue	Value indicating missing data	NaN	Db	1
Sun_angles_times³	Measurement Time Stamp for each Sun geometry sample		db	start_mid_stop
units	UDUNITS unit name	GPS MJD2000		1
_FillValue	Value indicating missing data	NaN	db	1

Table 7-14: OL_1_RAC___ RC_annotation description

The one-byte Quality flags structure is defined in the table below following the conventions detailed in volume 1 for the ordering of bits.

7	6	5	4	3	2	1	0
A	B	C	Spare				

Table 7-15 – Detailed structure of the one-byte Quality Flags variable

With:

- **A: invalid_dark_offset_coefficient flag** set to '1' if the percentage of valid pixels ($100 \cdot \text{Valid_DO_Num} / \text{Shutter_nF}$) used in the time average of the Dark Offset Coefficients computation is below the threshold `Invalid_DO_Coef_Thres`.
Note: In case no spectral relaxation is applied on the counts and one time averaged counts used to compute the integrated Dark Offset over the microbands is not valid, this flag is set to '1' as well.
- **B: invalid_gain_coefficient flag** set to '1' if the percentage of valid pixels ($100 \cdot \text{Valid_G_Num} / \text{Diffuser_nF}$) used in the time average of the Gain Coefficients computation, is below the threshold `Invalid_G_Coef_Thres` OR if the calibration sequence did not include diffuser measurements (`Diffuser_nF = 0`).
- **C: invalid_dark_current_coefficient flag** set to '1' if the percentage of valid pixels ($100 \cdot \text{Valid_DC_Num} / \text{Shutter_nF}$) used in the time average of the Dark Current Coefficients computation is below the threshold `Invalid_DC_Coef_Thres`.
Note: In case no spectral relaxation is applied on the counts and one time averaged counts used to compute the integrated Dark Current over the microbands is not valid, this flag is set to '1' as well.
- **Spare:** spare bits set to '0'.

7.2.2 Spectral Calibration: OL_1_SPC___

7.2.2.1 Package Description

An "OL_1_SPC___" product is composed of 1 measurement and 2 annotation data files.

7.2.2.1.1 OL_1_SPC___ product summary

Product Package Type OL_1_SPC		Description OLCI calibration product containing wavelength characterization from spectral calibration			
Product Level	Diss. Timeliness	Product Category	Application Domain	Spatial Resolution	
1	(NRT)	Not Available to the user			
Product Dissemination Unit N/A		Number of Package components	Number of Measurement Data Files	Number of Annotation Data Files	Number of Representation Information Files
		5 ⁴	1	2	0
Product Package Structure					
Manifest file (see section 7.2.2.2 and 8 for more details)					
File name			Composition		
xfdumanifest.xml			See section		
Measurement Data files (see section 7.2.2.3 for more details)					N.O
File name			Composition		
cal_wavelengths.nc			absolute_central_wavelength, shutter_mean_dark_pixels, shutter_mean_blank_pixels, diffuser_mean_dark_pixels, diffuser_mean_blank_pixels		
Annotation Data files (see section 7.2.2.4 for more details)					N.O
File name			Composition		
time_coordinates.nc			time_stamp		
SC_annotations.nc			rows_index , quality_flags, shutter_CCD_temperature, diffuser_CCD_temperature		
Representation Information Files					N.O
File name			Composition		
none					

Table 7-16: OLCI Spectral Calibration Level 1 product physical composition

⁴ Number of Package components includes the manifest and the OLQC Report.

7.2.2.2 Manifest File

The structure of the Manifest element is described in [AD- 2].

7.2.2.2.1 Wrapped Metadata

According to [AD- 2], Wrapped Metadata are grouped in Primary Metadata, common to all Sentinel 3 products and Secondary Metadata, specific for instrument and processing level.

Primary Metadata are described in [AD- 2].

Secondary Metadata for the OLCI instrument are reported in Table 7-22. Last columns of the table indicate the applicability of Metadata fields to the processing Level.

*< Complete secondary metadata is described in details in [AD- 4].
The content of this table will be embedded in the document when it will be finalized >*

Table 7-17: Secondary Metadata for OLCI products

7.2.2.3 Measurement Data Files

7.2.2.3.1 Wavelengths File

Element name	Description	Range or value	T	D
detectors	Number of instrument detectors per frame (covering the five cameras)	3700		
bands_total	Number of OLCI bands, including the smear band	22		
dark_pixels	Number of dark pixels for the five OLCI cameras	50		
blank_pixels	Number of blank pixels for the five OLCI cameras	20		
diffuser_acquisitions	Number of frames acquired during the second orbit of the spectral calibration sequence while CM is in spectral diffuser position			
selected_rows	Number of rows selected to compute the absolute central wavelength			
orbit	Number of orbits treated during the run (corresponds to orbits n and n+1)	2		
<common_global_attributes>	Common global attributes (including additional as defined in 4.1.3.1)		st	1
absolute_central_wavelength	Absolute central wavelengths for all pixels of all cameras and the diffuser_acquisitions selected rows	[390. 1040]	fl	selected_rows diffuser_acquisitions detectors
units	UDUNITS unit name	nm		1
_FillValue	Value indicating missing data	-1		1
shutter_mean_dark_pixels	Time average of the dark pixels of the 5 cameras at the configured bands for spectral calibration plus the smear band, all acquired in shutter position of both orbit N and N+1	[0; 200]	fl	orbit bands_total dark_pixels
units	UDUNITS unit name	count		1
shutter_mean_blank_pixels	Time average of the blank pixels of the 5 cameras at the configured bands for spectral calibration plus the smear band, all acquired in shutter position of both orbit N and N+1	[0; 200]	fl	orbit bands_total blank_pixels
units	UDUNITS unit name	count		1
diffuser_mean_dark_pixels	Time average of the dark pixels of the 5 cameras at the configured bands for spectral calibration plus the smear band, all acquired in diffuser position of both orbit N and N+1	[0; 200]	fl	orbit bands_total dark_pixels
units	UDUNITS unit name	count		1
diffuser_mean_blank_pixels	Time average of the blank pixels of the 5 cameras at the configured bands for the spectral calibration plus the smear band, all acquired in diffuser position of both orbit N and N+1	[0; 200]	fl	orbit bands_total blank_pixels
units	UDUNITS unit name	count		1

Table 7-18 – OL_1_SPC___ cal_wavelengths description

7.2.2.4 Annotation Data Files

7.2.2.4.1 Time Coordinates

Element name	Description	Range or value	T	D
diffuser_acquisitions	Number of frames acquired during the second orbit of the spectral calibration sequence while CM is in spectral diffuser position			
<common global attributes>	Common global attributes (including additional as defined in 4.1.3.1)		st	1
time_stamp	Measurement time stamp for each row of the product		sll	diffuser_acquisitions
standard_name	CF Standard name	time		1
units	UDUNITS unit name	"microseconds since 2000-01-01 00:00:00"		1

Table 7-19 – OL_1_SPC___ time annotation data file description

7.2.2.4.2 General Annotations File

Element name	Description	Range or value	T	D
diffuser_acquisitions	Number of frames acquired during the second orbit of the spectral calibration sequence while CM is in spectral diffuser position			
detectors	Number of instrument detectors per frame (covering the five cameras)	3700		
modules	Number of camera modules	5		
min_mean_max	Dimension of 3 to hold min/mean/max values	3		
orbit	Number of orbits treated during the run (corresponds to orbits n and n+1)	2		
selected_rows	Number of rows selected to computer the absolute central wavelength	50		
<common global attributes>	Common global attributes (including additional as defined in 4.1.3.1)		st	1
rows_index	Selected rows index for which the wavelengths are provided	[0, 519]	us	selected_rows
units	UDUNITS unit name			1
quality_flags	Quality flags		uc	selected_rows diffuser_acquisitions detectors
thresholds	Thresholds used to compute quality flags		us	2
do_avg_length	Length of the average led to compute the dark offset coefficient, i.e. length of sub-sequences where CM is in diffuser position	1000	us	1
flag_masks	List of bit fields describing boolean or enumerated flags		uc	5
flag_meanings	List of flag meanings composing this variable		st	1
shutter_CCD_temperature	CCD temperature in shutter mode	[-100; 100]	FI	orbit modules min_mean_max
units	UDUNITS unit name	C		1
diffuser_CCD_temperature	CCD temperature in diffuser mode	[-100; 100]	fl	orbit modules min_mean_max
units	UDUNITS unit name	C		1

Table 7-20 – OL_1_SPC___ SC_annotation annotation data file description

The one byte Quality flags structure is defined in the table below, following the conventions detailed in volume 1 for the ordering of bits.

7	6	5	4	3	2	1	0
A	B	C	D	E	Spare		

Table 7-21 – Detailed structure of the one-byte Quality Flags variable

With:

- **A: invalid_wavelength flag** set to '1' if the wavelength is considered as invalid, i.e. at least one of the three following flags is raised.
- **B: invalid_dark_offset_coefficient_for_first_orbit** set to '1' if the number of valid pixels used in the average for computation of the dark offset coefficients associated to the calibration sequence of the first orbit (i.e. using the radiometric diffuser), is below the threshold "Invalid_DO_Coef_Thres" defined in the SPH.
- **C: invalid_dark_offset_coefficient_for_second_orbit** set to '1' following the same rule as for "Invalid_DO_Coef1", but applied on pixels of the calibration sequence of the second orbit (i.e. using the spectral diffuser).
- **D: invalid_input_data** set to '1' when either Radiometric or Spectral Diffuser data is missing or of insufficient quality to be submitted to derive reliable relative Spectral reflectance.
- **E: invalid_fit_model** set to '1' if the linear model of reflectance derived from a least square fitting between the measured reflectance and the reference one is not enough accurate, i.e. the residual error is above the threshold "Invalid_fit_model_Thres" at the optimal spectral shift j_{min} .
- **Spare:** spare bits set to 0.

Note:

1. *The valid pixels used in the time average during the computation of dark offset coefficients are the ones that are not flagged as "invalid" during the Data Packets Extraction stage, and have no saturated samples at all.*
2. *the index of the spatial dimension of the arrays of Quality Flags, if counted from 0, is identical to the Detector Index defined for the Earth Observation Level 1b product in section 7.1.1.3.2.*

The list of values allowed for the flag_masks and flag_meanings attributes is detailed in table below.

flag_masks	flag_meanings
80h	invalid_wavelength
40h	invalid_dark_offset_coefficient_for_first_orbit
20h	invalid_dark_offset_coefficient_for_second_orbit
10h	invalid_input_data
08h	invalid_fit_model

Table 7-22 – List of allowed values to be taken by flags attributes

7.3 Browse Products

A browse product consists of a collection of metadata information gathered in the xfdumanifest.xml files and of one or more browse images. The images can represent one or several parameters or combination of parameters stored in one or several image formats.

7.3.1 Manifest File

The structure of the Manifest element is described in [AD- 2].

7.3.1.1 Wrapped Metadata

According to [AD- 2], Wrapped Metadata are grouped in Primary Metadata, common to all Sentinel 3 products.

Regarding the primary metadata: the fields are the same of the parent product, with different values for some fields (which are filled by the browse processor). There is no secondary metadata section for the browse products.

7.3.2 Level 1 products: OL_1_EFR_BW/OL_1_ERR_BW

7.3.2.1 Package Description

7.3.2.1.1 OL_1_EFR_BW/OL_1_ERR_BW product summary

Product Package Type OL_1_EFR_BW, OL_1_ERR_BW		<i>Description</i> OLCI Full/Reduced Resolution Browse L1 Product general structure			
Product Level	Diss. Timeliness	Product Category	Application Domain	Spatial Resolution	
1	(NRT)	Not Available to the user			
Product Dissemination Unit N/A		Number of Package components	Number of Measurement Data Files	Number of Annotation Data Files	Number of Representation Information Files
		3 ⁵	1	0	0
Product Package Structure					
Manifest file (see section 7.3.1 and 8 for more details)					

⁵ Number of Package components includes the manifest and the OLQC Report.

File name	Composition	
xfdumanifest.xml	XML fields	
Measurement Data files (see section 7.3.2.2 for more details)		N.O
File name	Composition	
BrowseImage.<ext>	True color image	
Annotation Data files		N.O
File name	Composition	
none		
Representation Information Files		N.O
File name	Composition	
none		

Table 7-23: OLCI Full/Reduced Resolution Browse L1 Product physical composition

7.3.2.2 Measurement Data Files

The Browse products contain 3 selected spectral bands (red, blue and green) of 0 to 255 intensity levels for each band.

The product may contain one browse image representing a combination of radiances in the allowed image formats (see list of accepted formats in AD-2).

8. MANIFEST FILE DESCRIPTION

The purpose of this section is to describe in detail all the data sets that are included with any of the Sentinel-3 OLCI product. Most of the description are common to all products and are therefore described in [AD- 2].

Only the IPF specific parts are detailed in this section.

8.1 InformationPackageMap

8.1.1 “OL_1_EFR___” Level 1 Product

The Information Package Map associated to the package of the OL_1_EFR___ product is reported in the next table.

Name				Description	Data Type	Value	Occ.
contentUnit				The information package map contains one content unit that includes the product data component included in the product.	Content Unit Type		1
	ID			Identifier of the package	S	“packageUnit”	0..1
	unitType			Describes the type of data referenced by this content unit	S	“Information Package”	0..1
	textInfo			Textual description of the content unit	S	“SENTINEL-3 OLCI Level 1 Earth Observation Full Resolution Product”	0..1
	pdiID			Identifier of the Preservation Description Information applicable to this content unit	S	“processing”	1
	dmdID			Identifier of the Metadata applicable to this content unit	S	In any order : "acquisitionPeriod" "platform" "orbitReference" "qualityInformation" "processing" "frameSet" "generalProductInformation" "olciProductInformation"	1
	contentUnit						1...21
		ID		Content unit ID	S	“Oaxx_radianceUnit”, xx = 01, 02, ..., 21	
		unitType			S	“Measurement Data Unit”	1
		textInfo			S	TOA radiance for OLCI acquisition band Oaxx xx = 01, 02, ..., 21	0..1
		dmdID		Attribute: Description Metadata Identifier	S	In any order: ‘geoCoordinatesData’ ‘timeCoordinatesData’ “qualityFlagsData”	0..1
		dataObjectPointer					1
			ID	Data Object pointer ID	S		0..1
			dataObjectID	Data Object element ID	S	“Oaxx_radianceData”, xx = 01, 02, ..., 21	1
	contentUnit						1...21

Name			Description	Data Type	Value	Occ.
		ID	Content unit ID	S	“Oaxx_radiance_uncUnit”, xx = 01, 02, ..., 21	
		unitType		S	“Measurement Data Unit”	1
		textInfo		S	log10 scaled Radiometric Uncertainty Estimate for OLCI acquisition band Oaxx xx = 01, 02, ..., 21	0..1
		dmdID	Attribute: Description Metadata Identifier	S	In any order: ‘geoCoordinatesData’ ‘timeCoordinatesData’ “qualityFlagsData”	0..1
		dataObjectPointer				1
			ID	Data Object pointer ID		0..1
			dataObjectID	Data Object element ID	“Oaxx_radiance_uncData”, xx = 01, 02, ..., 21	1
	contentUnit					1
		ID	Content unit ID	S	removedPixelsUnit	0..1
		unitType		S	“Measurement Data Unit”	1
		textInfo		S	“Removed Pixels information used for SYN L1c reconstruction”	0..1
		dmdID	Attribute: Description Metadata Identifier	S	‘timeCoordinatesData’	0..1
		dataObjectPointer				1
			ID	Data Object pointer ID		0..1
			dataObjectID	Data Object element ID	“removedPixelsData”	1
	contentUnit					1
		ID	Content unit ID	S	geoCoordinatesUnit	0..1
		unitType		S	“Annotation Data Unit”	1
		textInfo		S	“Geo Coordinates Annotations”	0..1
		dmdID	Attribute: Description Metadata Identifier	S	‘timeCoordinatesData’	0..1
		dataObjectPointer				1
			ID	Data Object pointer ID		0..1
			dataObjectID	Data Object element ID	“geoCoordinatesData”	1
	contentUnit					1
		ID	Content unit ID	S	qualityFlagsUnit	0..1
		unitType		S	“Annotation Data Unit”	1
		textInfo		S	“Quality flags”	0..1
		dmdID	Attribute: Description Metadata Identifier	S	In any order: timeCoordinatesData geoCoordinatesData	0..1
		dataObjectPointer				1
			ID	Data Object pointer ID		0..1
			dataObjectID	Data Object element ID	“qualityFlagsData”	1
	contentUnit					1
		ID	Content unit ID	S	“tieGeoCoordinatesUnit”	0..1
		unitType		S	“Annotation Data Unit”	1
		textInfo		S	“Tie-Point Geo Coordinate Annotations”	0..1
		dmdID	Attribute: Description Metadata Identifier	S	timeCoordinatesData	0..1
		dataObjectPointer				1

Name			Description	Data Type	Value	Occ.
		ID	Data Object pointer ID	S		0..1
		dataObjectID	Data Object element ID	S	"tieGeoCoordinatesData"	1
	contentUnit					1
		ID	Content unit ID	S	"tieGeometriesUnit"	0..1
		unitType		S	"Annotation Data Unit"	1
		textInfo		S	"Tie-Point Geometries Annotations"	0..1
		dmdID	Attribute: Description Metadata Identifier	S	tieGeoCoordinatesData timeCoordinatesData	0..1
		dataObjectPointer				1
		ID	Data Object pointer ID	S		0..1
		dataObjectID	Data Object element ID	S	"tieGeometriesData"	1
	contentUnit					1
		ID	Content unit ID	S	tieMeteoUnit	0..1
		unitType		S	"Annotation Data Unit"	1
		textInfo		S	"Tie-Point Meteo Annotations"	0..1
		dmdID	Attribute: Description Metadata Identifier	S	tieGeoCoordinatesData timeCoordinatesData	0..1
		dataObjectPointer				1
		ID	Data Object pointer ID	S		0..1
		dataObjectID	Data Object element ID	S	"tieMeteoData"	1
	contentUnit					1
		ID	Content unit ID	S	timeCoordinatesUnit	0..1
		unitType		S	"Annotation Data Unit"	1
		textInfo		S	"Time Coordinates Annotations"	0..1
		dmdID	Attribute: Description Metadata Identifier	S		0..1
		dataObjectPointer				1
		ID	Data Object pointer ID	S		0..1
		dataObjectID	Data Object element ID	S	"timeCoordinatesData"	1
	contentUnit					1
		ID	Content unit ID	S	instrumentDataUnit	0..1
		unitType		S	"Annotation Data Unit"	1
		textInfo		S	"Instrument Annotation"	0..1
		dmdID	Attribute: Description Metadata Identifier	S	In any order: 'geoCoordinatesData' 'timeCoordinatesData' 'qualityFlagsData'	0..1
		dataObjectPointer				1
		ID	Data Object pointer ID	S		0..1
		dataObjectID	Data Object element ID	S	"instrumentDataData"	1

Table 8-1: Information Package Map for L1 OLCI Full Resolution product

8.1.2 “OL_1_ERR___” Level 1 Product

The Information Package Map associated to the package of the OL_1_ERR___ product is reported in the next table.

Name				Description	Data Type	Value	Occ.
contentUnit				The information package map contains one content unit that includes the product data component included in the product.	Content Unit Type		1
	ID			Identifier of the package	S	“packageUnit”	0..1
	unitType			Describes the type of data referenced by this content unit	S	“Information Package”	0..1
	textInfo			Textual description of the content unit	S	“SENTINEL-3 OLCI Level 1 Earth Observation Reduced Resolution Product”	0..1
	pdiID			Identifier of the Preservation Description Information applicable to this content unit	S	“processing”	1
	dmdID			Identifier of the Metadata applicable to this content unit	S	In any order : "acquisitionPeriod" "platform" "orbitReference" "qualityInformation" "processing" "frameSet" "generalProductInformation" "olciProductInformation"	1
	contentUnit						1..21
		ID		Content unit ID	S	“Oaxx_radianceUnit”, xx = 01, 02, ..., 21	
		unitType			S	“Measurement Data Unit”	1
		textInfo			S	TOA radiance for OLCI acquisition band Oaxx xx = 01, 02, ..., 21	0..1
		dmdID		Attribute: Description Metadata Identifier	S	In any order: ‘geoCoordinatesData’ ‘timeCoordinatesData’ “qualityFlagsData”	0..1
		dataObjectPointer					1
			ID	Data Object pointer ID	S		0..1
			dataObjectID	Data Object element ID	S	“Oaxx_radianceData”, xx = 01, 02, ..., 21	1
	contentUnit						1..21
		ID		Content unit ID	S	“Oaxx_radiance_uncUnit”, xx = 01, 02, ..., 21	
		unitType			S	“Measurement Data Unit”	1
		textInfo			S	log10 scaled Radiometric Uncertainty Estimate for OLCI acquisition band Oaxx xx = 01, 02, ..., 21	0..1
		dmdID		Attribute: Description Metadata Identifier	S	In any order: ‘geoCoordinatesData’ ‘timeCoordinatesData’ “qualityFlagsData”	0..1
		dataObjectPointer					1

Name			Description	Data Type	Value	Occ.
		ID	Data Object pointer ID	S		0..1
		dataObjectID	Data Object element ID	S	“Oaxx_radiance_uncData”, xx = 01, 02, ..., 21	1
	contentUnit					1
		ID	Content unit ID	S	geoCoordinatesUnit	0..1
		unitType		S	“Annotation Data Unit”	1
		textInfo		S	“Geo Coordinates Annotations”	0..1
		dmdID	Attribute: Description Metadata Identifier	S	‘timeCoordinatesData’	0..1
		dataObjectPointer				1
		ID	Data Object pointer ID	S		0..1
		dataObjectID	Data Object element ID	S	“geoCoordinatesData”	1
	contentUnit					1
		ID	Content unit ID	S	qualityFlagsUnit	0..1
		unitType		S	“Annotation Data Unit”	1
		textInfo		S	“Quality flags”	0..1
		dmdID	Attribute: Description Metadata Identifier	S	timeCoordinatesData geoCoordinatesData	0..1
		dataObjectPointer				1
		ID	Data Object pointer ID	S		0..1
		dataObjectID	Data Object element ID	S	“qualityFlagsData”	1
	contentUnit					1
		ID	Content unit ID	S	“tieGeoCoordinatesUnit”	0..1
		unitType		S	“Annotation Data Unit”	1
		textInfo		S	“Tie-Point Geo Coordinate Annotations”	0..1
		dmdID	Attribute: Description Metadata Identifier	S	timeCoordinatesData	0..1
		dataObjectPointer				1
		ID	Data Object pointer ID	S		0..1
		dataObjectID	Data Object element ID	S	“tieGeoCoordinatesData”	1
	contentUnit					1
		ID	Content unit ID	S	“tieGeometriesUnit”	0..1
		unitType		S	“Annotation Data Unit”	1
		textInfo		S	“Tie-Point Geometries Annotations”	0..1
		dmdID	Attribute: Description Metadata Identifier	S	tieGeoCoordinatesData timeCoordinatesData	0..1
		dataObjectPointer				1
		ID	Data Object pointer ID	S		0..1
		dataObjectID	Data Object element ID	S	“tieGeometriesData”	1
	contentUnit					1
		ID	Content unit ID	S	tieMeteoUnit	0..1
		unitType		S	“Annotation Data Unit”	1
		textInfo		S	“Tie-Point Meteo Annotations”	0..1
		dmdID	Attribute: Description Metadata Identifier	S	tieGeoCoordinatesData timeCoordinatesData	0..1
		dataObjectPointer				1

Name				Description	Data Type	Value	Occ.
			ID	Data Object pointer ID	S		0..1
			dataObjectID	Data Object element ID	S	“tieMeteoData”	1
	contentUnit						1
			ID	Content unit ID	S	timeCoordinatesUnit	0..1
			unitType		S	“Annotation Data Unit”	1
			textInfo		S	“Time Coordinates Annotations”	0..1
			dmdID	Attribute: Description Metadata Identifier	S		0..1
			dataObjectPointer				1
			ID	Data Object pointer ID	S		0..1
			dataObjectID	Data Object element ID	S	“timeCoordinatesData”	1
	contentUnit						1
			ID	Content unit ID	S	instrumentDataUnit	0..1
			unitType		S	“Annotation Data Unit”	1
			textInfo		S	“Instrument Annotation”	0..1
			dmdID	Attribute: Description Metadata Identifier	S	In any order: ‘geoCoordinatesData’ ‘timeCoordinatesData’ ‘qualityFlagsData’	0..1
			dataObjectPointer				1
			ID	Data Object pointer ID	S		0..1
			dataObjectID	Data Object element ID	S	“instrumentDataData”	1

Table 8-2: Information Package Map for L1 OLCI Reduced Resolution product

8.1.3 “OL_1_RAC___” Level 1 Product

The Information Package Map associated to the package of the OL_1_RAC___ product is reported in the next table.

Name				Description	Data Type	Value	Occ.
	contentUnit			The information package map contains one content unit that includes the product data component included in the product.	Content Unit Type		1
			ID	Identifier of the package	S	“packageUnit”	0..1
			unitType	Describes the type of data referenced by this content unit	S	“Information Package”	0..1
			textInfo	Textual description of the content unit	S	“SENTINEL-3 OLCI Level 1 Radiometric Calibration Product”	0..1
			pdiID	Identifier of the Preservation Description Information applicable to this content unit	S	“processing”	1

Name				Description	Data Type	Value	Occ.
	dmdID			Identifier of the Metadata applicable to this content unit	S	In any order : "acquisitionPeriod" "platform" "orbitReference" "qualityInformation" "frameSet" "processing" "generalProductInformation" "olciProductInformation"	1
	contentUnit						1
		ID		Content unit ID	S	radiometricCoefUnit	0..1
		unitType			S	"Measurement Data Unit"	1
		textInfo			S	"Radiometric Coefficients Data"	0..1
		dmdID		Attribute: Description Metadata Identifier	S		0..1
		dataObjectPointer					1
			ID	Data Object pointer ID	S		0..1
			dataObjectID	Data Object element ID	S	"radiometricCoefData"	1
	contentUnit						1
		ID		Content unit ID	S	rcAnnotationsUnit	0..1
		unitType			S	"Annotation Data Unit"	1
		textInfo			S	"Radiometric Coefficients Annotations"	0..1
		dmdID		Attribute: Description Metadata Identifier	S		0..1
		dataObjectPointer					1
			ID	Data Object pointer ID	S		0..1
			dataObjectID	Data Object element ID	S	" rcAnnotationsData"	1

Table 8-3: Information Package Map for L1 Radiometric Calibration OLCI Product

8.1.4 “OL_1_SPC___” Level 1 Product

The Information Package Map associated to the package of the OL_1_SPC___ product is reported in the next table.

Name				Description	Data Type	Value	Occ.
contentUnit				The information package map contains one content unit that includes the product data component included in the product.	Content Unit Type		1
	ID			Identifier of the package	S	“packageUnit”	0..1
	unitType			Describes the type of data referenced by this content unit	S	“Information Package”	0..1
	textInfo			Textual description of the content unit	S	“SENTINEL-3 OLCI Level Spectral Calibration Product”	0..1
	pdiID			Identifier of the Preservation Description Information applicable to this content unit	S	“processing”	1
	dmdID			Identifier of the Metadata applicable to this content unit	S	In any order : “acquisitionPeriod” “platform” “orbitReference” “qualityInformation” “frameSet” “processing” “generalProductInformation” “olciProductInformation”	1
	contentUnit						1
		ID		Content unit ID	S	calWavelengthsUnit	0..1
		unitType			S	“Measurement Data Unit”	1
		textInfo			S	“Spectral Calibration wavelength measurements”	0..1
		dmdID		Attribute: Description Metadata Identifier	S	“timeCoordinatesData	0..1
		dataObject Pointer					1
			ID	Data Object pointer ID	S		0..1
			dataObjectID	Data Object element ID	S	“calWavelengthsData”	1
	contentUnit						1
		ID		Content unit ID	S	scAnnotationsUnit	0..1
		unitType			S	“Annotation Data Unit”	1
		textInfo			S	“Spectral Calibration Annotations”	0..1
		dmdID		Attribute: Description Metadata Identifier	S	timeCoordinatesData	0..1
		dataObject Pointer					1
			ID	Data Object pointer ID	S		0..1
			dataObjectID	Data Object element ID	S	“scAnnotationsData”	1
	contentUnit						1
		ID		Content unit ID	S	timeCoordinatesUnit	0..1
		unitType			S	“Annotation Data Unit”	1
		textInfo			S	“Time Coordinates”	0..1
		dmdID		Attribute: Description Metadata Identifier	S		0..1
		dataObject Pointer					1
			ID	Data Object pointer ID	S		0..1
			dataObjectID	Data Object element ID	S	“timeCoordinatesData”	1

Table 8-4: Information Package Map for L1 Spectral Calibration OLCI Product

8.1.5 “OL_1_EFR_BW/OL_1_ERR_BW” L1 Browse Products

The Information Package Map associated to the package of the OL_1_EFR_BW/OL_1_ERR_BW products is reported in the next table.

Name				Description	Data Type	Value	Occ.
contentUnit				The information package map contains one content unit that includes the product data component included in the product.	Content Unit Type		1
	ID			Identifier of the package	S	“packageUnit”	0..1
	unitType			Describes the type of data referenced by this content unit	S	“Information Package”	0..1
	textInfo			Textual description of the content unit	S	“SENTINEL-3 OLCI Level 1 Browse Product”	0..1
	pdiID			Identifier of the Preservation Description Information applicable to this content unit	S	“processing”	1
	dmdID			Identifier of the Metadata applicable to this content unit	S	In any order : “acquisitionPeriod” “platform” “orbitReference” “generalInformation” “qualityInformation” “processing” “frameSet”	1
	contentUnit						1
		ID		Content unit ID	S	brwImage01Unit	0..1
		unitType			S	“Measurement Data Unit”	1
		textInfo			S	“True Colour Image”	0..1
		dmdID		Attribute: Description Metadata Identifier	S		0..1
		dataObject Pointer					1
			ID	Data Object pointer ID	S		0..1
			dataObjectID	Data Object element ID	S	“brwImage01Data”	1

Table 8-5: Information Package Map for L1 OLCI Browse Products

8.2 Metadata Section

See [AD- 2] for the metadata general description.

8.3 Data Object Section

The data object section of the manifest includes one data object per data object pointer. Each data object pointer is identified with its dataObjectID as defined in the information package map in section 8.1.

8.3.1 Measurement Data File

8.3.1.1 “OL_1_EFR” Level 1 Product

Data Objects for the OLCI OL_1_EFR Level 1 product are listed in the next table.

Name		Description	Data type	Occ.	Value
Data Object		This element references the Data Component included in the L1 product.	U	1..*	
	ID	Data Component ID	S	1	“Oaxx_radianceData” xx = 01, 02, ..., 21
	byte Stream	Pointer to the Data Component	U	1..*	
	ID	Byte stream ID	S	0..1	
	mimeType	MIME type for the referenced Data Component	E	1	“application/x-netcdf”
	size	Size of the Data Object File	L	1	
	fileLocation	Description of the location of the data component file	U	1	
	locator Type	Type of the file location	URL	0..1	URL
	href	Relative path of the file (in the file system) containing the referenced Data Component	S		“Oaxx_radiance.nc” xx = 01, 02, ..., 21
	textInfo	Textual description of the Data Component	S	0..1	
	checksum	Checksum for the Data Component	U	1	

Name			Description	Data type	Occ.	Value
		checksumName		E	1	MD5
Data Object			This element references the Data Component included in the L1 product.	U	1..*	
	ID		Data Component ID	S	1	"Oaxx_radiance_uncData" xx = 01, 02, ..., 21
	byte Stream		Pointer to the Data Component	U	1..*	
		ID	Byte stream ID	S	0..1	
		mimeType	MIME type for the referenced Data Component	E	1	"application/x-netcdf"
		size	Size of the Data Object File	L	1	
		fileLocation	Description of the location of the data component file	U	1	
		locator Type	Type of the file location	URL	0..1	URL
		href	Relative path of the file (in the file system) containing the referenced Data Component	S		"Oaxx_radiance_unc.nc" xx = 01, 02, ..., 21
		textInfo	Textual description of the Data Component	S	0..1	
		checksum	Checksum for the Data Component	U	1	
		checksumName		E	1	MD5
Data Object			This element references the Data Component included in the L1 product.	U	1..*	
	ID		Data Component ID	S	1	"removedPixelsData"
	byte Stream		Pointer to the Data Component	U	1..*	
		ID	Byte stream ID	S	0..1	
		mimeType	MIME type for the referenced Data Component	E	1	"application/x-netcdf"

Name			Description	Data type	Occ.	Value	
		size		Size of the Data Object File	L	1	
		fileLocation		Description of the location of the data component file	U	1	
			locator Type	Type of the file location	URL	0..1	URL
			href	Relative path of the file (in the file system) containing the referenced Data Component	S		“removed_pixels.nc”
			textInfo	Textual description of the Data Component	S	0..1	
		checksum		Checksum for the Data Component	U	1	
			checksumName		E	1	MD5

Table 8-6: OL_1_EFR Level 1 measurements Data Objects

8.3.1.2 “OL_1_ERR” Level 1 Product

Data Objects for the OLCI OL_1_ERR Level 1 product are shown in the next table:

Name			Description	Data type	Occ.	Value
Data Object			This element references the Data Component included in the L1 product.	U	1..*	
	ID		Data Component ID	S	1	“Oaxx_radianceData” xx = 01, 02,..., 21
	byte Stream		Pointer to the Data Component	U	1..*	
		ID	Byte stream ID	S	0..1	
		mimeType	MIME type for the referenced Data Component	E	1	"application/x-netcdf"
		size	Size of the Data Object File	L	1	
		fileLocation	Description of the location of the data component file	U	1	
			locator Type	URL	0..1	URL
			href	S		“Oaxx_radiance.nc” xx = 01, 02,..., 21
			textInfo	S	0..1	
		checksum	Checksum for the Data Component	U	1	
			checksumName	E	1	MD5
Data Object			This element references the Data Component included in the L1 product.	U	1..*	
	ID		Data Component ID	S	1	“Oaxx_radiance_uncData” xx = 01, 02,..., 21
	byte Stream		Pointer to the Data Component	U	1..*	

Name			Description	Data type	Occ.	Value
		ID	Byte stream ID	S	0..1	
		mimeType	MIME type for the referenced Data Component	E	1	“application/x-netcdf”
		size	Size of the Data Object File	L	1	
		fileLocation	Description of the location of the data component file	U	1	
		locator Type	Type of the file location	URL	0..1	URL
		href	Relative path of the file (in the file system) containing the referenced Data Component	S		“Oaxx_radiance_unc.nc” xx = 01, 02, ..., 21
		textInfo	Textual description of the Data Component	S	0..1	
		checksum	Checksum for the Data Component	U	1	
		checksumName		E	1	MD5

Table 8-7: OL_1_ERR Level 1 Data Objects

8.3.1.3 “OL_1_RAC___” Level 1 Product

Data Object for the OLCI OL_1_RAC Level 1 product is reported in the next table.

Name			Description	Data type	Occ.	Value
Data Object			This element references the Data Component included in the L1 product.	U	1..*	
	ID		Data Component ID	S	1	radiometricCoefData
	byte Stream		Pointer to the Data Component	U	1..*	
		ID	Byte stream ID	S	0..1	
		mimeType	MIME type for the referenced Data Component	E	1	"application/x-netcdf"
		size	Size of the Data Object File	L	1	
		fileLocation	Description of the location of the data component file	U	1	
			locator Type	URL	0..1	URL
			href	S		“radiometric_coef.nc“
			textInfo	S	0..1	
		checksum	Checksum for the Data Component	U	1	
			checksumName	E	1	MD5

Table 8-8: OL_1_RAC Level 1 Data Object

8.3.1.5 “OL_1_SPC___” Level 1 Product

Data Object for the OLCI OL_1_SPC Level 1 product is described in the next table.

Name			Description	Data type	Occ.	Value
Data Object			This element references the Data Component included in the L1 product.	U	1..*	
	ID		Data Component ID	S	1	calWavelengthsData
	byte Stream		Pointer to the Data Component	U	1..*	
		ID	Byte stream ID	S	0..1	
		contentType	MIME type for the referenced Data Component	E	1	"application/x-netcdf"
		size	Size of the Data Object File	L	1	
		fileLocation	Description of the location of the data component file	U	1	
		locator Type	Type of the file location	URL	0..1	URL
		href	Relative path of the file (in the file system) containing the referenced Data Component	S		“cal_wavelengths.nc“
		textInfo	Textual description of the Data Component	S	0..1	
		checksum	Checksum for the Data Component	U	1	
		checksumName		E	1	MD5

Table 8-9: OL_1_SPC Level 1 Data Object

8.3.1.7 “OL_1_EFR_BW/OL_1_ERR_BW” L1 Browse Products

Data Object for OLCI Level 1 browse products are shown in the next table.

Name			Description	Data type	Occ.	Value
Data Object			This element references the Data Component included in the L1 product.	U	1..*	
	ID		Data Component ID	S	1	brwImage01Data
	byte Stream		Pointer to the Data Component	U	1..*	
		ID	Byte stream ID	S	0..1	
		mimeType	MIME type for the referenced Data Component	E	1	One value among: "image/jpeg" " image/tiff" " image/png" " image/jp2"
		size	Size of the Data Object File	L	1	
		fileLocation	Description of the location of the data component file	U	1	
			locator Type	URL	0..1	URL
			href	S		One value among: "BrowseImage.jpeg" "BrowseImage.tiff" "BrowseImage.png" "BrowseImage.jp2"
			textInfo	S	0..1	
		checksum	Checksum for the Data Component	U	1	
			checksumName	E	1	MD5

Table 8-10: OLCI Browse Level 1 Data Object

8.3.2 Specific Annotation Data File

Name				Description	Data type	Occ.	Value
Data Object				This element references the Data Component included in the product.	U	1..*	
	ID			Data Component ID	S	1	“qualityFlagsData”
	byte Stream			Pointer to the Data Component	U	1..*	
		ID		Byte stream ID	S	0..1	
		mimeType		MIME type for the referenced Data Component	E	1	“application/x-netcdf”
		size		Size of the Data Object File	L	1	
		fileLocation		Description of the location of the Data component file	U	1	
			locator Type	Type of the file location	URL	0..1	URL
			href	Relative path of the file (in the file system) containing the referenced Data Component	S		“qualityFlags.nc”
			textInfo	Textual description of the Data Component	S	0..1	
		checksum		Checksum for the Data Component	U	1	
			checksumName		E	1	MD5

Table 8-11: Quality flags Metadata Object

Name				Description	Data type	Occ.	Value
Data Object				This element references the Data Component included in the product.	U	1..*	
	ID			Data Component ID	S	1	"rcAnnotationsData"
	byte Stream			Pointer to the Data Component	U	1..*	
		ID		Byte stream ID	S	0..1	
		mimeType		MIME type for the referenced Data Component	E	1	"application/x-netcdf"
		size		Size of the Data Object File	L	1	
		fileLocation		Description of the location of the Data component file	U	1	
			locator Type	Type of the file location	URL	0..1	URL
			href	Relative path of the file (in the file system) containing the referenced Data Component	S		"RC_annotations.nc"
			textInfo	Textual description of the Data Component	S	0..1	
		checksum		Checksum for the Data Component	U	1	
			checksumName		E	1	MD5

Table 8-12: Rc annotation Metadata Object

Name				Description	Data type	Occ.	Value
Data Object				This element references the Data Component included in the product.	U	1..*	
	ID			Data Component ID	S	1	“scAnnotationsData”
	byte Stream			Pointer to the Data Component	U	1..*	
		ID		Byte stream ID	S	0..1	
		mimeType		MIME type for the referenced Data Component	E	1	"application/x-netcdf"
		size		Size of the Data Object File	L	1	
		fileLocation		Description of the location of the Data component file	U	1	
			locator Type	Type of the file location	URL	0..1	URL
			href	Relative path of the file (in the file system) containing the referenced Data Component	S		“SC_annotations.nc”
			textInfo	Textual description of the Data Component	S	0..1	
		checksum		Checksum for the Data Component	U	1	
			checksumName		E	1	MD5

Table 8-13: Sc annotation Metadata Object

9. PRODUCT SIZE

In the following table the approximate size of each OLCI file composing the Level 1 products is given.

The sizes computation have been based on a full OLCI acquisition (FR) orbit which corresponds approximately to 60 000 frames (44 minutes). The RR product is based on 15 000 frames.

No file compression is applied.

9.1 OLCI Level 1

9.1.1 EO mode (OL_1_EFR___/OL_1_ERR___)

Tie points related figures account for an along-track spacing of 1 to be compliant with driver [OPCONF-1] of the Driver TN document. The size of the radiances includes the 21 bands, as well as the associated radiance uncertainty.

Element name	Description	Size in FR mode in GBytes	Size in RR mode in GBytes
xfdumanifest.xml	Sentinel-SAFE product manifest		
Oa##_radiance.nc	Radiance for OLCI acquisition bands 01 to 21	11.418	0.714
Oa##_radiance_unc.nc	log10 scaled Radiometric Uncertainty Estimate for OLCI acquisition bands 01 to 21	5.709	0.357
removed_pixels.nc	Removed pixels information needed for L1c generation	0.468	N/A
time_coordinates.nc	Time stamp annotations	0.00045	0.00011
geo_coordinates.nc	High resolution georeferencing data	2.719	0.170
qualityFlags.nc	Classification and quality flags	1.087	0.068
tie_geo_coordinates.nc	Low resolution georeferencing data	0.034	0.009
tie_geometries.nc	Sun and View angles	0.069	0.017
tie_meteo.nc	ECMWF meteorology data	0.534	0.133
instrument_data.nc	Instrument data	0.545	0.035
Total		22.583	1.384

Table 9-1: OL_1_EFR___/OL_1_ERR___ product size

9.1.2 Radiometric Calibration mode (OL_1_RAC___)

Element name	Description	Size
xfdumanifest.xml	Sentinel-SAFE product manifest	
radiometric_coef.nc	Radiometric coefficients data	1890.9 Kbytes
RC_annotations.nc	Radiometric calibration annotations	549.5 Kbytes
Total		2440.3 Kbytes

Table 9-2: OL_1_RAC___ product size

9.1.3 Spectral calibration mode (OL_1_SPC___)

The following sizes have been computed accounting for 500 frames acquired during the second orbit of the spectral calibration sequence while CM is in spectral diffuser position.

Element name	Description	Size
xfdumanifest.xml	Sentinel-SAFE product manifest	
cal_wavelengths.nc	Spatial calibration wavelength data	21.194 Mbytes
time_coordinates.nc	Time data	3.9063 Kbytes
SC_annotations.nc	Spectral calibration annotations	5.2931 Mbytes
Total		26.49 Mbytes

Table 9-3: OL_1_SPC___ product size

9.2 Browse products

Due to the type and level of compression and the format of the image used in the processing, the size of the browse products cannot be accurately defined. Compared to the volume of data of the measurement/annotation, this size may be considered negligible.

End of the document