



PROGRAMME OF
THE EUROPEAN UNION



SPECIFICATIONS

Sentinel-3 Product Unit Definition and Metadata ICD

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Reference
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APPROVAL

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CHANGE LOG

Reason for change	Issue Nr.	Revision Number	Date
Removal of Sentinel-3 BW Products and Introduction GS Element Applicability	1	1	Jan. 2020
Addition of SL_1_ESSTAX product type, introduction of additional Attributes and alignment of metadata syntaxes	1	2	Apr. 2020
Removal of Auxiliary Product Types that no longer exist and update to Reference Documents	1	3	Jun. 2020
Update in line with GMQ review	1	4	Sep. 2020
Removal of Auxiliary files for Browse products and addition of Reference Documents	1	5	Nov. 2020
Update to align to the latest Sentinel-3 baseline	1	6	Apr. 2021
“Checkpoint 2022” update	1	7	Sept. 2022
Update to [AD-1] reference version and date	1	8	Apr. 2023
Update of Sentinel-3 Product Attributes Mapping Excel file with new product types	1	9	Mar. 2024

CHANGE RECORD

Issue Number 1	Revision Number 1		
Reason for change	Date	Pages	Paragraph(s)
Removal of Sentinel-3 BW Products, Introduction GS Element Applicability and general update to Table 2-1	Jan. 2020	Multiple	Table 2-1
Minor updates to Tables 3-1 and 4-1	Jan. 2020	Multiple	Table 3-1, Table 4-1

Issue Number 1	Revision Number 2		
Reason for change	Date	Pages	Paragraph(s)
Addition of SL_1_ESSTAX Product Type to the Sentinel-3 Auxiliary Data List	Apr. 2020	12	Table 2-2
Introduction of lastOrbitNumber, lastOrbitDirection and lastRelativeOrbitNumber Attributes	Apr. 2020	12	Table 4-1
Minor updates to align the metadata syntax found within the Sentinel-3 products and [RD-1]	Apr. 2020	“Sentinel-3 Product Attributes Mapping.xls”	All spreadsheets

Issue Number 1	Revision Number 3		
Reason for change	Date	Pages	Paragraph(s)
Update to Reference Documents	Jun. 2020	6	1.3
Removal of Auxiliary Product Types that no longer exist	Jun. 2020	9-14	Table 2-2
processingDate attribute applicable to Auxiliary products	Jun. 2020	12	Table 4-1

Issue Number 1	Revision Number 4		
Reason for change	Date	Pages	Paragraph(s)
Update to Reference Documents	Sep. 2020	6	1.3
Addition of Auxiliary Data definition	Sep. 2020	7	1.5
Addition of AUX_MOEORB, AUX_POEORB, AUX_PRLPTF and AUX_PRCPTF Auxiliary products	Sep. 2020	8	Table 2-2
Change from MPMF to Cal/Val (MPC)	Sep. 2020	9-14	Table 2-2
Removal of GS Element Applicability columns	Sep. 2020	8	Table 2-1

Issue Number 1	Revision Number 5		
Reason for change	Date	Pages	Paragraph(s)
Removal of Auxiliary files for Browse products	Nov. 2020	12	Table 2-2
Addition of Product Units Configuration as Reference Documentation	Nov. 2020	6	1.3

Issue Number 1	Revision Number 6		
Reason for change	Date	Pages	Paragraph(s)
Update to the Reference Documents versions and issue dates	Apr. 2021	6	1.3
Addition of SL_2_IMSCAX and SL_2_DIMSAX Auxiliary product types	Apr. 2021	13	Table 2-2
Removal of GS Applicability from Table 3-1	Apr. 2021	10	Table 3-1
Addition of ADG applicability for OData attributes mapping related to AUX products	Apr. 2021	12	Table 4-1

Issue Number 1	Revision Number 7		
Reason for change	Date	Pages	Paragraph(s)
Addition of [AD-1] applicable document	Sept. 2022	6	1.2
Removal of Table 2-1 and Table 2-2, and reference to [AD-1]	Sept. 2022	8	2.1, 2.3
Addition of GeoFootprint property	Sept. 2022	10	Table 3-1
Removal of “coordinates” OData attribute in favour of the usage of Footprint and GeoFootprint properties	Sept. 2022	12	Table 4-1
Addition of POD applicability	Sept. 2022	12	Table 4-1
Replacement of Data Distribution (DD) with Data Access (DA)	Sept. 2022	7, 12	1.4, Table 4-1

Issue Number 1	Revision Number 8		
Reason for change	Date	Pages	Paragraph(s)
Update to [AD-1] reference version and date	Apr. 2023	6	1.2

Issue Number 1	Revision Number 9		
Reason for change	Date	Pages	Paragraph(s)
Update of Sentinel-3 Product Attributes Mapping Excel file with new product types and attributes	Mar. 2024	n/a	Sentinel-3 Product Attributes Mapping_v1.9.xlsx
Addition of processingBaseline and nbFire attributes	Mar. 2024	12	Table 4-1



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1 INTRODUCTION

1.1 Purpose and Scope

The scope of this document is to be used as an annex for the CSC Common Entity Definition Document [RD-3] in order to describe the Product Entity Properties, the Product Attributes and the corresponding metadata elements that shall be catalogued and queryable for Sentinel products. This document provides the mapping and packaging format for the Sentinel-3 products.

1.2 Applicable Documents

ID	Document Reference	Document Title
[AD-1]	ESA-EOPG-EOPGC-TN-58	Copernicus Ground Segment Sentinels Data Flow Configuration

Table 1-1 – Applicable Documents

1.3 Reference Documents

ID	Document Reference	Document Title
[RD-1]	S3IPF PDS 008 - i3r8	Sentinel-3 Metadata Specification
[RD-2]	GMES-S3GS-EOPG-TN-09-0009	Sentinel-3 PDGS File Naming Convention
[RD-3]	ESA-EOPG-EOPGC-IF-5	Copernicus Space Component Ground Segment - Common Entity Definition Document
[RD-4]	OGC 17-003r2	OGC EO Dataset Metadata GeoJSON(-LD) Encoding Standard
[RD-5]	OGC 10-157r4	OGC Earth Observation Metadata profile of Observations & Measurements
[RD-6]	ESA-EOPG-EOPGC-TN-13	Copernicus Space Component Ground Segment Operations Glossary
[RD-7]	ESA-EOPG-CSCOP-TN-0043	Sentinel-3 LAND PDGS Product Units Configuration
[RD-8]	ESA-EOPG-CSCOP-TN-0054	Sentinel-3 Level-0 and Level-1 Product Units Configuration

Table 1-2 – Reference Documents

1.4 Acronyms and Abbreviations

Acronym	Description
ADF	Auxiliary Data File
ADG	Auxiliary Data Gathering
AUX	Auxiliary
CSC	Copernicus Space Component
DA	Data Access
FOS	Flight Operation Segment
GS	Ground Segment
ICD	Interface Control Document
IPF	Instrument Processing Facility
JSON	JavaScript Object Notation
LTA	Long Term Archiving
MPC	Mission Performance Cluster
PDGS	Payload Data Ground Segment
POD	Precise Orbit Determination
PR	Systematic Production
SAFE	Standard Archive Format for Europe

Table 1-3 – Acronyms and Abbreviations

1.5 Definitions

Auxiliary Data – Data which enhance processing and utilization of remote sensing instrument data. The auxiliary data are not necessarily captured by the same data collection process as the instrument data. Auxiliary data include data collected by any other platform or process (e.g. meteorological data from ECWMF or NCEP), data providing processing configuration information typically for data calibration and or instrument characterisation (e.g. processing auxiliary files), and data providing information on satellite position and velocity (orbit auxiliary files). Auxiliary data help in data processing but are also data sets in their own right and may be relevant for end-users in specific *User Level Data* exploitation scenarios.

2 SENTINEL-3 PRODUCTS AND AUXILIARY DATA

2.1 Sentinel-3 Product List

[AD-1] describes the list of Sentinel-3 products which are required to be circulated within the Copernicus Space Component (CSC) Ground Segment (GS) elements (e.g. from Systematic Production to Long Term Archiving or Data Access systems).

Products that are disseminated are cut in accordance with "Product Dissemination Units" as described in the Product Units Configuration documentation [RD-7] and [RD-8].

2.2 Sentinel-3 Product Packaging

All Sentinel-3 products follow the corresponding Product Format Specifications and are packaged as **non-compressed** 'zip' packages.

2.3 Sentinel-3 Auxiliary Data List

[AD-1] presents the list of Sentinel-3 Auxiliary Data which are required to be circulated between the CSC GS elements. It must be noted that Sentinel-3 Auxiliary files data set content may change with new processing baselines and therefore, the list provided in [AD-1] is subject to change over time.



3 SENTINEL-3 PRODUCT ENTITY PROPERTIES MAPPING

[RD-3] defines the Generic CSC Common Entity Properties. Table 3-1, below, provides the mapping between these Generic Product Entity Properties and the Sentinel-3 product metadata. Most of the properties defined in [RD-3] are generated by the CSC services. The following table describes the properties that map directly to the Sentinel-3 product metadata.

OData Product Entity Properties	Type	Description	Cardinality	Corresponding Sentinel-3 Metadata		Example
				L0, L1 & L2	AUX	
Name	String	Data file name (according to the Sentinel file naming conventions) plus the file extension	1	n/a Based on file name	n/a Based on file name	S3A_OL_2_LFR____20180714T090502_20180714T090802_20180715T133132_0179_047_050_2340_LN1_O_NT_002.SEN3.zip
ContentDate	TimeRange	The sensing range period. Compound property with start and end times in UTC in the format YYYY-MM-DDThh:mm:ss.sssssZ	1	sentinel-safe:acquisitionPeriod/ sentinel-safe:startTime sentinel-safe:acquisitionPeriod/ sentinel-safe:stopTime	sentinel3aux:generalProductInformation/ sentinel3aux:validityStartTime sentinel3aux:generalProductInformation/ sentinel3aux:validityStopTime	"ContentDate": { "Start": "2019-07-23T09:29:46.667482Z", "End": "2019-07-23T09:32:46.667482Z" }
Footprint	Geography	Footprint of the product	0..1	sentinel-safe:frameSet/ sentinel-safe:footPrint/ gml:posList	n/a	geography'SRID=4326; Polygon((-41.15749 66.766701,-31.740927 67.629135,-31.479883 66.860405,-40.616844 66.011871,-41.15749 66.766701))'

OData Product Entity Properties	Type	Description	Cardinality	Corresponding Sentinel-3 Metadata		Example
				L0, L1 & L2	AUX	
GeoFootprint	Geography	Footprint of the product following the GeoJSON format	0..1	sentinel-safe:frameSet/ sentinel-safe:footPrint/ gml:posList	n/a	"GeoFootprint":{ "type": "Polygon", "coordinates": [[[-59.3169, 2.6367], [-63.105, -14.0539], [-60.8506, -14.4245], [-57.1309, 2.3269], [-59.3169, 2.6367]] } }

Table 3-1 – Sentinel-3 Product Entity Properties mapping to Sentinel-3 metadata

*n/a = not available



4 SENTINEL-3 PRODUCT ATTRIBUTES MAPPING

All relevant metadata elements of the Sentinel-3 products shall be indexed in the Product Attributes, additional metadata elements may also be identified if appropriate. In order to provide a harmonised model across the Sentinel missions the JSON property naming from [RD-4] is preferred for the Attribute Names. In case an attribute is not defined in [RD-4] the naming used in the mission specific metadata files, harmonised across the Sentinel missions, is preferred. The Product Attributes mapping for all Sentinel-3 products is described in the Excel file “Sentinel-3 Product Attributes Mapping”, which is packaged with this document. A summary of the Sentinel-3 Product Attributes mapping across all Sentinel-3 products is presented in Table 4-1 below. It should be highlighted that, in order to harmonise the metadata model across the Sentinel missions, in some cases an “alias” for the value defined in the Sentinel-3 metadata is mapped to a standardised value to be used by the CSC GS elements, in other cases a standard value is defined where it is otherwise unavailable from the product.

OData Attribute Name	Sentinel-3 Product Attributes Mapping							Applicability				
	L0 Products	MWR	OLCI	SRAL	SLSTR	SYNERGY	AUX	PR	ADG	POD	LTA	DA
beginningDateTime	X	X	X	X	X	X	X	X	X	X	X	X
endingDateTime	X	X	X	X	X	X	X	X	X	X	X	X
platformShortName	X	X	X	X	X	X	X	X	X	X	X	X
platformSerialIdentifier	X	X	X	X	X	X	X	X	X	X	X	X
instrumentShortName	X	X	X	X	X	X		X			X	X
operationalMode	X	X	X	X	X	X		X			X	X
productType	X	X	X	X	X	X	X	X	X	X	X	X
timeliness	X	X	X	X	X	X	X	X	X	X	X	X
baselineCollection	X	X	X	X	X	X	X	X	X	X	X	X
brightCover			X					X			X	X
snowOrIceCover						X		X			X	X

OData Attribute Name	Sentinel-3 Product Attributes Mapping							Applicability				
	LO Products	MWR	OLCI	SRAL	SLSTR	SYNERGY	AUX	PR	ADG	POD	LTA	DA
salineWaterCover			x		x ¹	x		x			x	x
coastalCover			x		x ¹	x		x			x	x
freshInlandWaterCover			x		x ¹	x		x			x	x
tidalRegionCover			x		x ¹	x		x			x	x
landCover			x	x	x ¹	x		x			x	x
closedSeaCover				x				x			x	x
continentalIceCover				x				x			x	x
openOceanCover				x				x			x	x
cloudCover			x		x ¹			x			x	x
orbitNumber	x	x	x	x	x	x		x			x	x
lastOrbitNumber	x	x	x	x	x	x		x			x	x
orbitDirection	x	x	x	x	x	x		x			x	x
lastOrbitDirection	x	x	x	x	x	x		x			x	x
relativeOrbitNumber	x	x	x	x	x	x		x			x	x
lastRelativeOrbitNumber	x	x	x	x	x	x		x			x	x
cycleNumber	x	x	x	x	x	x		x			x	x
processingLevel	x	x	x	x	x	x		x			x	x
processingDate	x	x	x	x	x	x	x	x	x	x	x	x
processingCenter	x	x	x	x	x	x	x	x	x	x	x	x
processorName	x	x	x	x	x	x	x	x	x	x	x	x
processorVersion	x	x	x	x	x	x	x	x	x	x	x	x
processingBaseline	x	x	x	x	x	x	x	x			x	x
nbFire					x ²			x				x

Table 4-1 – Sentinel-3 Product Attributes mapping
¹ For SLSTR Products only the metadata reported for the 1 km grid shall be considered.

² Only applicable to FRP products (SL_2_FRP____)