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**OPGW SOFTWARE REQUIREMENTS SPECIFICATION  
DOCUMENT  
FOR HMA FOLLOW ON TASK 4 – ORDER**

**SUMMARY**

This document specifies the requirements of the Ordering & Programming Gateway (OPGW) component that is in charge of providing the implementation of the Order Server required in HMA Follow On Task 4 – Order.

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## 1 INTRODUCTION

This document defines the software requirements of the ESA G/S Ordering & Programming Gateway – OPGW system that is the Order Server implementation required in HMA Follow On Task 4 – Order. OPGW provides the Ordering Service [AD-5] via generating calls to appropriate back-end servers (EOLI XML Ordering Server).

OPGW system is in charge of providing the following main functionalities:

- Checking the identity of the issuer of the requests according to the DAIL UM ICD [AD-11];
- Supporting the HMA Ordering ICD

## 2 APPLICABLE AND REFERENCE DOCUMENTS

The following table provide list of applicable documents:

Id.	Title	Reference	Issue	Date
[AD-1]	EARTHNET ONLINE XML FRONT-END INTERFACE CONTROL DOCUMENT	EOLI-XML-006-ICD	2.8	21 Jan 2008
[AD-2]	OGC™ Catalogue Services Specification 2.0 Extension Package for ebRIM (ISO/TS 15000-3) Application Profile: Earth Observation Products	OGC 06-131r6	0.2.4	07 May 2008
[AD-3]	Application schema for Earth Observation products	OGC 06-080r2	0.9.3	21 Jul 2008
[AD-4]	ECSS – Space engineering - Software	ECSS-E-ST-40C		06 Mar 2009
[AD-5]	Ordering Services for Earth Observation Products	OGC 06-141r2	0.9.5 draft 1	13 Nov 2009
[AD-6]	EARTHNET ONLINE XML FRONT-END: ORDER AND ON-LINE ACCESS EXTENSION INTERFACE CONTROL DOCUMENT	EOLI/Order-XML-ICD	3.4	07 Apr 2008
[AD-7]	OpenGIS® Sensor Planning Service Application Profile for EO Sensors	OGC 07-018r2	0.9.5	19 Nov 2007
[AD-8]	OPGW Software Requirements Specification Document	OSME-USMP-SEDA-RS-08-1855	1.2	20 Mar 2009
[AD-9]	Proposal for HMA Follow On Task 4 - Order		1.0	13 Mar 2009
[AD-10]	M2AS MMOHS IMPORT/EXPORT XML ICD	OSME-USMP-SEDA-IS-08-2059	1.1	21 Nov 2008
[AD-11]	User Management Interfaces for Earth Observation Services	OGC 07-118r1	0.0.4	30 Jun 2009
[AD-12]	SOFTWARE DEVELOPMENT PLAN FOR HMA FOLLOW ON TASK 4 – ORDER	P50638/DSASGT-2995-09/00	1.0	20 Nov 2009
[AD-13]	SOFTWARE PRODUCT ASSURANCE PLAN FOR HMA FOLLOW ON TASK 4 – ORDER	P-P50638/DSAQUD-3046-09/00	1.0	20 Nov 2009

**Table 2-1. Applicable Documents**



The following table provide list of reference documents:

Id.	Title	Reference	Issue	Date
[RD-1]	Prototype Operations Concept	HMA-PR-SPB-EN-0001	1.0	12 Aug 2006

**Table 2-2: Reference Documents**

### 3 TERMS, DEFINITION AND ABBREVIATIONS TERMS

Acronym	Meaning
API	Application Programmer's Interface
AR	Acceptance Review
ASCII	American Standard for Code Information Interchange
ASN.1	Abstract Syntax Notation One
BNF	Backus-Naur Form
CDR	Critical Design Review
CM	Contributing Mission
COTS	Commercial off-the-shelf
DAIL	Data Access Integration Layer
DAP	Data Access Portfolio
DB	Database
EO-A	Enhanced On-line Access
EOLI	Earthnet On-line Interactive
EoliSA	Earthnet On-line Interactive and Stand-Alone Client: main user interface to the catalogue and ordering on-line services
ESA	European Space Agency
GDS	Guide Directory Server
GMES	Global Monitoring for Environment and Security
GSC	GMES Space Component
GSDR	Ground Segment Design Review
GSOV	Ground Segment Operation Validation.
HMA	Heterogeneous Mission Accessibility
ICD	Interface Control Document
LTA	Long term Archive
M2EOS	Multi Mission Earth Observation Services
M2AS	Multi Mission authorization Service
M2BS	Multi Mission Browse Server
M2CS	Multi Mission Catalogue Server
MMMC	Multi Mission Master Catalogue
MMOHS	Multi-Mission Order Handling System
MTA	Medium Term Archive
MUIS	Multi-Mission User information Services
N/A	Not Applicable
NRT	Near Real Time
OFS	Order Front-End Server
OMT	Object Modelling Technique
OPGW	ESA G/S Ordering and Programming Gateway
OR	Operational qualification Review





Acronym	Meaning
OSME	Operational Support, Maintenance and Evolution Contract
PEP	Policy Enforcement Point
PBS	Product Browse System
PDR	Preliminary Design Review
PDS	Payload Data Segment
RSC	Red Spider Catalogue
SEDA	Serco / Elsag Datamat Consortium
SOAP	Simple Object Access Protocol
SSE	Service Support Environment
TBC	To Be Confirmed
TBD	To Be Defined
TBW	To Be Written
TCP	Transmission Control Protocol
UML	Unified Modelling Language
USMP	User Services & Mission Planning
WMS2EOS	WMS to Earth Observation Services
WSM	ORACLE Web Service Manager

**Table 3-1: Acronyms and definitions**

## 4 SOFTWARE OVERVIEW

This section describes the function and purpose of OPGW system providing also the context in which it is used and the first level architectural decomposition.

### 4.1 Function and purpose

The following figure shows the context where OPGW is put and the external entities having relationship with it.

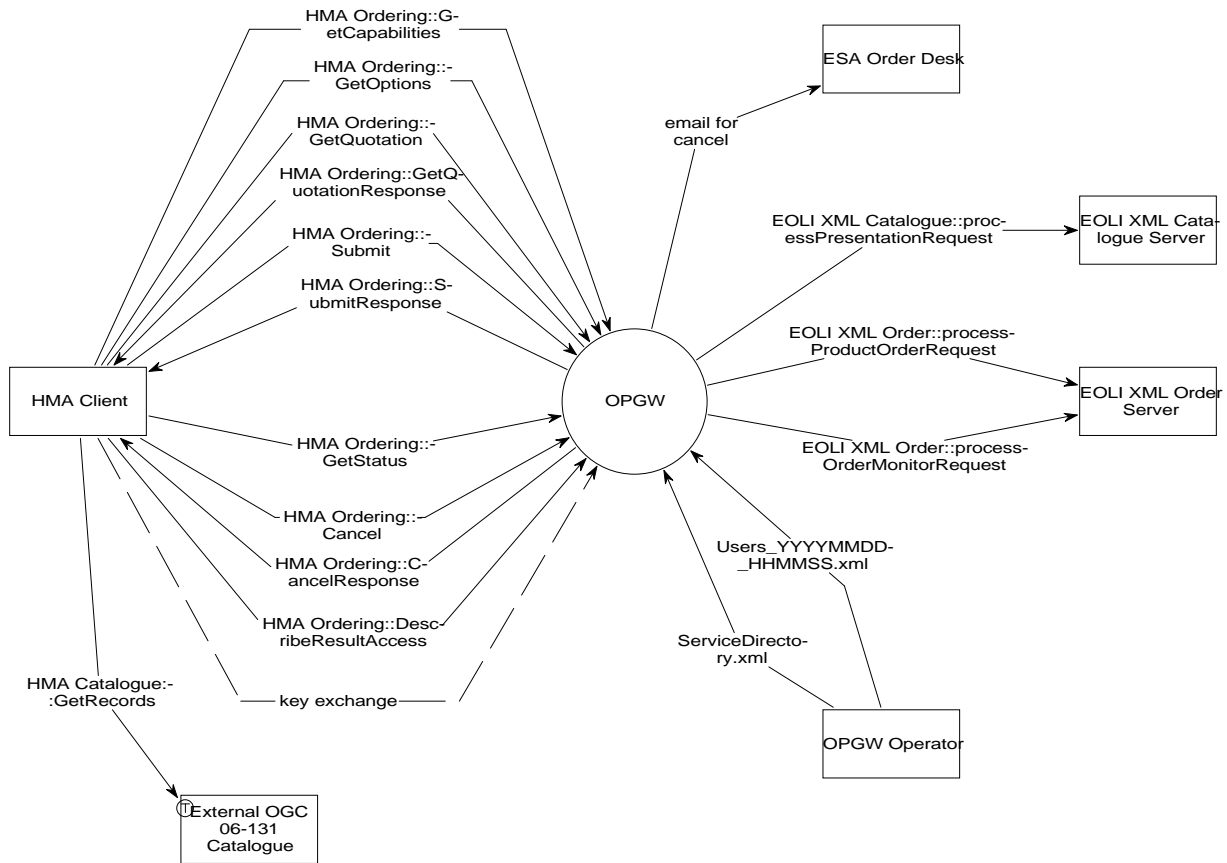


Figure 4-1: OPGW Context Diagram

As highlighted in the previous figure, OPGW interacts with the following entities:

- **HMA Client**

It is a client in charge of sending SOAP requests compliant with OGC 06-141. The expected HMA Clients are:

- The TEAM engine, which will be used for validating the updated interfaces;



- SSE, which will be connected to OPGW and added to the list of available Service Providers.

The following are the exchanged interfaces:

- OGC 06-131, for ordering interfaces;
- OGC 07-118, for the encoding of user management information (it is the protocol currently used by the DAIL).

#### - **EOLI XML Catalogue Server**

It is a place holder for a Web Service implementing the EOLI XML Catalogue interface for ESA collections. At the moment, this interface is provided by the MUIS system (via DSM + IDS), but MUIS is going to be replaced by M2EOS during 2010 and then OPGW will be connected to this system (actually M2AS and then M2CS sub-system).

#### - **EOLI XML Order Server**

It is a place holder for a Web Service implementing the EOLI XML Ordering interface for ESA collections. At the moment, this interface is provided by MUIS system (via DSM + OFS and then MMOHS), but MUIS is going to be replaced by M2EOS during 2010 and then OPGW will be connected to this system (actually M2AS and then MMOHS).

#### - **OPGW Operator**

It is the entity in charge of operating the OPGW. It has to provide the following configuration items:

- Configuration files for the basic working of OPGW;
- Capabilities XML files for the implemented ordering service;
- List of configured users, with profile, i.e. the users that allowed issuing orders via OPGW.

#### - **External OGC 06-131 Catalogue**

This is the OGC Catalogue storing the EO Product metadata to be queried and ordered from the HMA Client.

The ordering of products is performed after having discovered the products of interest via a catalogue search. The catalogue is not needed for the working of OPGW: in fact it is able to process the orders on its own; the catalogue is needed for supporting the user on selecting the product of interest so OPGW has an indirect relationship with the External OGC Catalogue. The external catalogue is queried by the HMA Client for discovering the list of products available for ordering; then the HMA Client will send a product order to OPGW specifying the product identifiers returned by OGC Catalogue. Then OPGW and OGC Catalogue shall understand the same product identifiers.

This catalogue must be kept synchronized with OPGW in order to make sure that the EO products returned by this catalogue have the same identifiers understood from OPGW and the same EO Product metadata is available also in the connected EOLI XML Catalogue Server.

#### - **ESA Order Desk**

The ESA order desk is notified by e-mail in case of cancellation of an HMA Order.

ESA User Services do not support the on-line cancellation of orders, but this function is supported via interaction with the Order Desk. In order to simulate the on-line cancellation of orders, OPGW will send an e-mail to a configured address asking for the cancellation of the specified order.



The interfaces exchanged between the listed components and entities are:

- **OPGW vs. HMA Client:**

- HMA Ordering ICD [AD-5]: it specifies the HMA interfaces for ordering products from catalogue.
- HMA Identity Management ICD [AD-11]: it is not explicitly mentioned in above diagram, but it is implicitly included in all HMA interfaces: in fact the user identity information is for ordering is encoded according to [AD-11].

- **OPGW vs. EOLI XML Catalogue Server:**

- EOLI XML Catalogue [AD-1]: it allows querying the EO products catalogue for getting the details about the product metadata records to be ordered.

- **OPGW vs. EOLI XML Order Server:**

- EOLI XML Order Server [AD-6]: it allows issuing EO product orders and order monitoring requests.

- **OPGW vs. OPGW Operator:**

- Monitor & control interfaces for operating and configuring OPGW.
- Users\_YYYYMMDD\_HHMMSS.xml [AD-10], it carries on the user profile information needed for preparing EOLI XML Orders to send.
- ServiceDirectory.xml, it carries on the order options configured for issuing EO product orders to the ESA User Services.

- **HMA Client vs. External OGC Catalogue :**

- HMA Catalogue ICD [AD-2], for allowing the client to get the list of products to be ordered.

- **OPGW vs. ESA Order Desk:**

- OPGW sends automatically e-mails to the Order Desk in case the client asks the cancellation of an already submitted order.

## 4.2 Environmental considerations

This section describes the hardware and software resources used to define a target environment.

Hardware resources:

- CPU: at least INTEL P4 2.4 GHz or equivalent;
- RAM: at least 512 MB
- At least 300 MB of free disk space;
- Graphic Adapter: no specific needs.

Software resources:

- Operating System: Linux RedHat ES 5 Update 2 (being a Java development, the system can be built and operated also on Windows XP OS).
- Tomcat 6.0.18



- Ant 1.6.5
- Java 1.5.0.16;
- XML Beans 2.2.0
- HSQLDB 1.8.0.7

### 4.3 Relationship with other systems

The following is the list of systems having relationship with OPGW:

#### - SSE (main HMA Client)

It is in charge of providing the so called "HM Services", heterogeneous multi mission services, to its clients by the integration layer between the GMES contributing missions. It is in charge of splitting and routing requests towards the GMES contributing missions and packing together the received responses. It relies on the contributing missions for the actual execution of requests. M2EOS is one of the linked Ground Segments.

#### - External OGC Catalogue

It allows data providers and data users to register and discover metadata describing a wide range of resources (OpenGIS web services, datasets, imagery, Earth Observation, etc.).

It need that implements the interface OGC 06-131r3 EO Products Extension Package for ebRIM Profile of CSW 0.1.8

#### - M2EOS

M2EOS is the system in charge of providing the ESA GS User Services. It provides the following functions:

- Authorization of incoming requests;
- Catalogue of all stored EO product Collections;
- Archive of Browsers & thumbnails to show when browsing the EO product catalogue;
- Submission and monitoring of EO Product orders.

M2EOS system is in charge of replacing the currently operational Multi-Mission User Information Services (MUIS) system.

#### - MUIS

It provides a rich set of user services which enable easy and efficient access to collections of earth observation data. It allows users to:

- search the product of interest within the catalogue of supported products through the Inventory service;
- retrieve thumbnails and browses of products through the Browse service;
- issue product orders and receive follow-on through the Ordering service;

Many missions are accessible through MUIS, between them: ENVISAT, ERS, Landsat, NOAA, etc.

This system is currently providing the ESA User Services, but it will be replaced with M2EOS during 2010.



## 4.4 Constraints

None.



## 5 REQUIREMENTS

This section specifies the requirements applicable to the OPGW component, which are mainly derived by the HMA-E project and specified in [AD-8].

For the requirement specification the following terms are used:

- **SHALL** – The word “shall” is used to indicate a mandatory requirement.
- **SHOULD** – Requirements containing ‘should’ are considered strongly recommended, i.e. an explicit justification is required if they are not met.
- **IT IS DESIRABLE** - Requirements containing ‘it is desirable’ should be considered in the current release but are not formal requirements.

### 5.1 General

OPGW requirements are divided in the following categories:

- **Functional Requirements**

These specify ‘what’ the system has to do. They define the purpose of the software/hardware. The functional requirements are derived from the logical model, which is in turn derived from the user's capability requirements.

- **Performance Requirements**

These specify numerical values for measurable variables (e.g. execution time, memory usage, rate, frequency, capacity, and speed).

- **Interface Requirements**

This section describes the interfaces between the OPGW sub-components, the interfaces between the OPGW and the external entities and the operator interface.

- **Operational Requirements**

This section describes the requirements for operating the system in its environment:

- Description of the possible different operational modes and the transition between them;
- The intended use scenarios.

- **Resource Requirements**

This section describes the hardware and software requirements for operating the system.

- **Design and Implementation Requirements**

This section lists the requirements driving the design of the OPGW e.g.:

- software standards
- design requirements
- design methods
- requirements on re-used software.

- **Security and Privacy Requirements**



This section specifies the requirements for making the system secure against threats to confidentiality, integrity and availability.

- **Portability Requirements**

This section lists the possible requirements the system has to comply with in order to be operated also on platforms different from the nominal one.

- **Software Quality Requirements**

This section specifies the quality requirements of the system.

- **Software Reliability and Maintainability Requirements**

These specify the acceptable mean time interval between failures of the SW/HW, averaged over a significant period (MTBF). They may also specify the minimum time between failures that is ever acceptable. Reliability requirements may have to be derived from the user's availability requirements.

Availability =  $MTBF / (MTBF + MTTR)$

- **Software Safety Requirements**

It lists any safety requirement applicable to the OPGW.

- **Software Configuration and Delivery Requirements**

It lists any requirement applicable to the selected delivery medium and any software configuration applicable to the software item.

- **Data Definition and Database Requirements**

It lists any requirement related to specific data format or structure to be exchanged with other systems or any database requirements.

Each requirement described in the following sections is composed of:

- **Identifier:** univocally identifies the requirement throughout the document.
- **Description:** full description of the requirement.
- **Source:** applicable or reference document the requirements is derived from. Many of requirements are mainly derived by the HMA-E project and specified with the Identifiers used into the Software Requirements document [AD-8].
- **Verification Method:** describes the method to be used for verifying the requirement compliance. The following values can be used:
  - **Analysis [A]**

This verification method implies use of analytical techniques (such as system engineering analysis, statistics, mathematical modelling, and simulations) and shall be used to verify such requirements
  - **Review of Design [D]**

This verification method may be used when approved design reports, technical descriptions, engineering drawings unambiguously show that the requirement is met.
  - **Inspection [I]**





Verification by inspection is only done when testing is insufficient or inappropriate. This method of verification is for those requirements that are normally performed by some form of visual inspection.

- **Demonstration [M]**

This verification method may be used when actual conduct can verify achievement of requirements such as service and access, transportability, human engineering features and processes hardware. A requirement which is of an operational or functional nature and is not quantified by a specific measurable parameter may be verified by demonstration.

- **Similarity [S]**

This verification method may be used when there is proof that the item is similar or identical in design and manufacturing processes to other previously qualified to equivalent or more stringent criteria.

- **Test [T]**

A requirement may be verified by test alone if the form of the specification is such that the requirement can be directly measured.

## 5.2 Functional requirements

### 5.2.1 Ordering Functionality

Identifier	Description	Source [AD-8]	Verification Method
SR-OPGW-FN-001	The OPGW shall allow its clients to submit product orders including archived order items.	SR-OPGW-FN-001	T
SR-OPGW-FN-005	The OPGW shall allow its clients to submit product orders including subscription.  Note: With HMA-E the ESA GS is able to support on-line subscriptions, then OPGW will rely on this function.	New	T
SR-OPGW-FN-010	The access to Ordering functionality shall be provided by a Gateway which translates incoming HMA Ordering request in EOLI XML requests and sends them to the ESA GS EOLI XML Ordering Server.	SR-OPGW-FN-010	T
SR-OPGW-FN-020	OPGW shall support ordering of products from the following missions / sensors: <ul style="list-style-type: none"> <li>▪ Envisat ASAR</li> <li>▪ Envisat MERIS</li> <li>▪ SPOT</li> </ul>	SR-OPGW-FN-020	T



Identifier	Description	Source [AD-8]	Verification Method
SR-OPGW-FN-030	<p>OPGW shall support ordering of products returned by the External OGC Catalogue configured in the same HMA Follow-on reference environment.</p> <p>Note: A companion HMA Catalogue must be set-up in order to allow the discovery and then the ordering of products.</p>	SR-OPGW-FN-030	T

## 5.2.2 User Management Functionality

Req.	Description	Source [AD-8]	Verification Method
SR-OPGW-FN-500	OPGW shall accept requests including the SAML token as specified in the DAIL UM ICD document [AD-11].	SR-OPGW-FN-500	T
SR-OPGW-FN-510	OPGW shall extract user profile information from the SAML Token embedded in HMA requests.	SR-OPGW-FN-510	T
SR-OPGW-FN-520	OPGW shall verify the signature embedded in the received SAML Token.	SR-OPGW-FN-520	T
SR-OPGW-FN-530	OPGW shall decrypt SAML assertions included in the SAML Token sent from the HMA Client.	SR-OPGW-FN-530	T
SR-OPGW-FN-540	<p>In order that the HMA request may be fulfilled by the ESA ground segment, the ESA user, to which the HMA request is targeted to, shall have the grants for: querying and ordering (past and future) at least the following product types:</p> <ul style="list-style-type: none"> <li>▪ querying and ordering (past) Envisat ASAR products</li> <li>▪ querying and ordering (past) Envisat MERIS products</li> <li>▪ querying and ordering (past) SPOT products</li> </ul>	SR-OPGW-FN-540	T



### 5.3 Performance requirements

Req.	Description	Source [AD-8]	Verification Method
SR-OPGW-PR-001	<p>In case of requests which are managed by a straightforward translation between the HMA and EOLI XML protocol i.e.:</p> <ul style="list-style-type: none"> <li>▪ Ordering::Submit</li> <li>▪ Ordering::GetStatus</li> </ul> <p>the response time shall not be greater than:</p> <ul style="list-style-type: none"> <li>▪ Total Response Time &lt; 5 seconds + Time Spent by ESA GS to process the EOLI requests.</li> </ul>	<p>SR-OPGW-PR-001</p> <p>(Updated see §3.3.2.2 [AD-9])</p>	T
SR-OPGW-PR-010	<p>In case of requests completely managed by OPGW (also by simulation):</p> <ul style="list-style-type: none"> <li>▪ Ordering::GetCapabilities</li> <li>▪ Ordering::GetOptions</li> <li>▪ Ordering::GetQuotation</li> <li>▪ Ordering::Cancel</li> <li>▪ Ordering::DescribeResultAccess</li> </ul> <p>the response time shall not be greater than 5 seconds.</p>	<p>SR-OPGW-PR-020</p> <p>(Updated see §3.3.2.2 [AD-9])</p>	T

### 5.4 Interface requirements

Req.	Description	Source [AD-8]	Verification Method
SR-OPGW-IF-001	<p>The OPGW shall provide access to the Ordering Functionality of ESA MM GS through interfaces compliant with the HMA Ordering ICD [AD-5].</p> <p>Note:</p> <p>See the following requirements for the list of supported functions and restrictions.</p>	<p>SR-OPGW-IF-001</p>	T
SR-OPGW-IF-010	<p>To support HMA Ordering ICD, the OPGW shall implement the following operations:</p> <ul style="list-style-type: none"> <li>▪ GetCapabilities</li> <li>▪ GetOptions</li> <li>▪ GetQuotation</li> <li>▪ Submit &amp; SubmitResponse</li> <li>▪ GetStatus</li> <li>▪ Cancel &amp; CancelResponse</li> <li>▪ DescribeResultAccess</li> </ul>	<p>SR-OPGW-IF-010</p> <p>(Updated see §3.3.2.2 [AD-9])</p>	T



Req.	Description	Source [AD-8]	Verification Method
SR-OPGW-IF-020	OPGW shall be able to provide order notification by calling the SubmitResponse operation implemented by the client (i.e. the entity that called the Submit operation).	SR-OPGW-IF-020	T
SR-OPGW-IF-030	The Capabilities data returned by GetCapabilities operation shall be extracted from the repository of OPGW configuration data.	SR-OPGW-IF-030	T
SR-OPGW-IF-040	The order options stored in OPGW shall be generated by converting the ServiceDirectory.xml file (managed by EOLI SA / EOLI Server).  The ServiceDirectory.xml file has to be manually provided by the operator. <ul style="list-style-type: none"> <li>▪ OPGW will answer to GetOptions request by accessing to the locally stored converted file.</li> </ul>	SR-OPGW-IF-040	T
SR-OPGW-IF-050	GetQuotation operation shall be implemented by calling the built-in testing capabilities of the HMA Skeleton.	SR-OPGW-IF-050  (Updated see §3.3.2.2 [AD-9])	T
SR-OPGW-IF-060	Submit operation shall be implemented by calling the processProductOrderRequest EOLI XML operation of EOLI XML Order Server mapping the HMA Ordering request and response messages on the EOLI XML request and response messages according to the table at §9.2.4.	SR-OPGW-IF-060	T
SR-OPGW-IF-070	In Submit operation the following values of HMA Ordering/Submit/statusNotification attribute shall be supported for the management of asynchronous notifications: <ul style="list-style-type: none"> <li>▪ None</li> <li>▪ Final</li> </ul> It is desirable to support "all" value.	SR-OPGW-IF-080	T
SR-OPGW-IF-080	For providing order status notification after order submission, the OPGW should poll the EOLI XML Order Server to get the order status.	SR-OPGW-IF-090	T
SR-OPGW-IF-090	GetStatus operation shall be implemented by calling the processOrderMonitorRequest operation of EOLI XML Order Server mapping the HMA Ordering request and response messages on the EOLI XML request and response messages according to the table at §9.2.6.	SR-OPGW-IF-100	T



Req.	Description	Source [AD-8]	Verification Method
SR-OPGW-IF-100	Cancel operation shall be implemented by calling the built-in testing capabilities of the HMA Skeleton.	SR-OPGW-IF-120  (Updated see §3.3.2.2 [AD-9])	T
SR-OPGW-IF-110	DescribeResultAccess operation shall be implemented by calling the built-in testing capabilities of the HMA Skeleton.	New see §3.3.2.2 [AD-9]	T

## 5.5 Operational requirements

Req.	Description	Source [AD-8]	Verification Method
SR-OPGW-OP-001	The OPGW shall provide the operator with an interface allowing checking logs of received requests.	SR-OPGW-OP-001	T
SR-OPGW-OP-010	The configuration data needed to the OPGW shall be kept within ASCII files.	SR-OPGW-OP-010	T
SR-OPGW-OP-020	The OPGW shall log received request and provided responses.	SR-OPGW-OP-020	T

## 5.6 Resources requirements

Req.	Description	Source [AD-8]	Verification Method
SR-OPGW-RS-001	The OPGW shall run on x86 PC with Linux Red Hat ES 5.2 OS.	SR-OPGW-RS-001	T
SR-OPGW-RS-010	The OPGW shall run on PC with 1GB RAM	SR-OPGW-RS-010	T
SR-OPGW-RS-020	The OPGW source code should be written in Java (as implied by the Skeleton).	SR-OPGW-RS-020	T
SR-OPGW-RS-030	The OPGW shall run on PC with Apache Tomcat (as implied by the Skeleton).	New see §3.3.2.2 [AD-9]	T



## 5.7 Design requirements and implementation constraints

Identifier	Description	Source [AD-8]	Verification Method
SR-OPGW-DI-001	The OPGW should be developed on the HMA Skeleton.	SR-OPGW-DI-001	D
SR-OPGW-DI-010	The OPGW development shall be based on re-use of existing software component ESA GS Ordering & Programming Prototype [RD-1].	SR-OPGW-DI-010	D
SR-OPGW-DI-020	OPGW development activities shall be carried out according ESA ECSS standards [AD-4] with the tailoring specified in the HMA FO Task 4 Proposal [AD-9].	SR-OPGW-DI-020	D

## 5.8 Security and privacy requirements

Identifier	Description	Source [AD-8]	Verification Method
SR-OPGW-SP-001	The access to OPGW resources HMA Order Service shall be allowed only to registered HMA Clients.	SR-OPGW-SP-001	T

## 5.9 Portability requirements

Req.	Description	Source [AD-8]	Verification Method
SR-OPGW-PB-001	The OPGW shall be developed using open source COTS whenever possible.	SR-OPGW-PB-001	

## 5.10 Software quality requirements

Req.	Description	Source [AD-8]	Verification Method
SR-OPGW-QA-001	The development of the OPGW component shall follow ECSS standards [AD-4] with the tailoring specified in the HMA FO Task 4 proposal [AD-9].	SR-OPGW-QA-001	D



Req.	Description	Source [AD-8]	Verification Method
SR-OPGW-QA-010	The OPGW component will be provided with the following documentation: <ul style="list-style-type: none"> <li>Software Requirement Specification Document (this document)</li> <li>Software Design Document</li> <li>Software Validation Test Specification</li> </ul>	SR-OPGW-QA-010	D

## 5.11 Software reliability requirements

Identifier	Description	Source [AD-8]	Verification Method
SR-OPGW-RM-001	<b>Nominal</b> availability of OPGW shall be 24 hours a day, 7 days a week to external users.  Comment:  This means that no operation must require shutdown of the service (unless for re-configuration / software update).	SR-OPGW-RM-001	T
SR-OPGW-RM-010	OPGW shall reject syntactically invalid requests.	SR-OPGW-RM-010	T

## 5.12 Maintainability requirements

None.

## 5.13 Software safety requirements

None.

## 5.14 Software configuration and delivery requirements

None.

## 5.15 Data definition and database requirements

Identifier	Description	Source [AD-8]	Verification Method
SR-OPGW-DD-001	The OPGW should be based on HSQLDB RDBMS.	SR-OPGW-DD-001	I



## 5.16 Human factors related requirements

None.

## 5.17 Adaptation and installation requirements

None.





## 6 VALIDATION APPROACH AND REQUIREMENTS

The system tests will verify the correct functioning and validate the requirements using an end-to-end approach running test procedures prepared in order to cover all meaningful operational scenarios.

The validation approach of each specified requirement has been already specified in section §5 (it is defined in the last column of each of the requirements tables).

External interfaces of the system will be stimulated via the appropriate prepared test tools.

In case of problems, investigation at interface level will be performed cross-checking with this document. The validation will be performed according to the envisaged main test designs:

### - TD1: Installation & configuration

The aim of this test design is to verify the correctness of the delivery kit i.e. software, installation & operation document. This test design deals with the building of the software, installation on run time environment, configuration and then start-up of the system.

One machine will be dedicated to this activity: that hosting the OPGW component.

Once all OPGW software items have been properly installed & configured then the OPGW is started-up.

### - TD2: Ordering Service validation

The aim of this test design is to verify the correct functioning of the supported HMA Ordering ICD interface:

- GetCapabilities
- GetOptions
- Submit & SubmitResponse
- GetStatus
- GetQuotation
- Cancel & CancelResponse
- DescribeResultAccess

Regarding the user identify management, the current assumption is that user information is encoded according to OGC 07-118 [AD-11].

## 6.1 Test Platform Validation Requirements

This section lists the requirements the test platform shall comply with.



Identifier	Description	Source	Verification Method
SR-OPGW-VR-001	<p>The test platform should include 2 machines:</p> <ul style="list-style-type: none"> <li>o 1 machine for the OPGW.</li> <li>o 1 machine for the test client.</li> </ul> <p>Note: in case of lack of 2 machines it is acceptable to use a single server for hosting the client and the OPGW.</p>	SR-OPGW-VR-001	T
SR-OPGW-VR-010	<p>A test tool in charge of capturing the HTTP SOAP messages exchanged between OPGW &amp; EOLI XML back-end servers shall be provided for proper test execution.</p> <p>Comment:</p> <p>Simple HTTP monitor tools like that provided with AXIS is considered sufficient.</p> <p>Ethereal is even better alternative.</p>	SR-OPGW-VR-010	T
SR-OPGW-VR-020	The OPGW shall be provided with a SOAP test tool for stimulating provided HMA Interfaces.	SR-OPGW-VR-020	T
SR-OPGW-VR-040	The OPGW will be provided with an ATP document	SR-OPGW-VR-040	T
SR-OPGW-VR-050	The OPGW ATP shall test the functionality about the ordering of archived products	SR-OPGW-VR-050	T
SR-OPGW-VR-060	<p>The OPGW ATP shall include tests against the following product collections:</p> <ul style="list-style-type: none"> <li>o Envisat ASAR</li> <li>o Envisat MERIS</li> <li>o SPOT</li> </ul>	SR-OPGW-VR-060	T



## 7 TRACEABILITY

This section presents the traceability matrix relate to

- OPGW for HMA FOLLOW ON task 4 - Order Requirements vs. HMA-E OPGW requirements
- HMA-E OPGW requirements non applicable for OPGW for HMA FOLLOW ON task 4 - Order

### 7.1 Traceability of OPGW – HMA Follow On Task 4 – Order w.r.t OPGW HMA-E Prototype

The following table lists how the original OPGW Requirements of HMA-E project requirements have been mapped on the new OPGW Requirements for HMA Follow On Task 4 - Order.

OPGW HMA-E prototype Requirement	OPGW HMA Follow On Requirement
SR-OPGW-FN-001	SR-OPGW-FN-001
SR-OPGW-FN-010	SR-OPGW-FN-010
SR-OPGW-FN-020	SR-OPGW-FN-020
SR-OPGW-FN-030	SR-OPGW-FN-030
SR-OPGW-FN-500	SR-OPGW-FN-500
SR-OPGW-FN-510	SR-OPGW-FN-510
SR-OPGW-FN-520	SR-OPGW-FN-520
SR-OPGW-FN-530	SR-OPGW-FN-530
SR-OPGW-FN-540	SR-OPGW-FN-540
SR-OPGW-PR-001	SR-OPGW-PR-001 (Updated see §3.3.2.2 [AD-9])
SR-OPGW-PR-020	SR-OPGW-PR-010 (Updated see §3.3.2.2 [AD-9])
SR-OPGW-IF-001	SR-OPGW-IF-001
SR-OPGW-IF-010	SR-OPGW-IF-010
SR-OPGW-IF-020	SR-OPGW-IF-020
SR-OPGW-IF-030	SR-OPGW-IF-030



OPGW HMA-E prototype Requirement	OPGW HMA Follow On Requirement
SR-OPGW-IF-040	SR-OPGW-IF-040
SR-OPGW-IF-050	SR-OPGW-IF-050 (Updated see §3.3.2.2 [AD-9])
SR-OPGW-IF-060	SR-OPGW-IF-060
SR-OPGW-IF-080	SR-OPGW-IF-070
SR-OPGW-IF-090	SR-OPGW-IF-080
SR-OPGW-IF-100	SR-OPGW-IF-090
SR-OPGW-IF-120	SR-OPGW-IF-100 (Updated see §3.3.2.2 [AD-9])
SR-OPGW-OP-001	SR-OPGW-OP-001
SR-OPGW-OP-010	SR-OPGW-OP-010
SR-OPGW-OP-020	SR-OPGW-OP-020
SR-OPGW-RS-001	SR-OPGW-RS-001
SR-OPGW-RS-010	SR-OPGW-RS-010
SR-OPGW-RS-020	SR-OPGW-RS-020
SR-OPGW-DI-001	SR-OPGW-DI-001
SR-OPGW-DI-010	SR-OPGW-DI-010
SR-OPGW-DI-020	SR-OPGW-DI-020
SR-OPGW-SP-001	SR-OPGW-SP-001
SR-OPGW-PB-001	SR-OPGW-PB-001
SR-OPGW-QA-001	SR-OPGW-QA-001
SR-OPGW-QA-010	SR-OPGW-QA-010
SR-OPGW-RM-001	SR-OPGW-RM-001
SR-OPGW-RM-010	SR-OPGW-RM-010



OPGW HMA-E prototype Requirement	OPGW HMA Follow On Requirement
SR-OPGW-VR-001	SR-OPGW-VR-001
SR-OPGW-VR-010	SR-OPGW-VR-010
SR-OPGW-VR-020	SR-OPGW-VR-020
SR-OPGW-VR-030	SR-OPGW-VR-030
SR-OPGW-VR-040	SR-OPGW-VR-040
SR-OPGW-VR-050	SR-OPGW-VR-050
SR-OPGW-VR-060	SR-OPGW-VR-060

**Table 7-1: HMA-E OPGW vs. OPGW Follow On Task 4 requirements traceability table.**

## 7.2 Non applicable HMA-E OPGW requirements

The following table reports the requirements of the HMA-E OPGW that have not been covered by OPGW HMA Follow On Task 4 – Order because not in the scope of this project.

Source	Description (original text)	OPGW Requirement
SR-OPGW-FN-040	OPGW shall support orders for future products via joint usage of Ordering & Programming interfaces.	n/a
SR-OPGW-FN-100	The OPGW shall allow its clients to submit product orders including future (planned / potential) order items.	n/a
SR-OPGW-FN-110	The access to ordering of future products functionality shall be provided by developing a Gateway translating incoming HMA Programming [AD-7] requests in EOLI XML requests.	n/a
SR-OPGW-FN-120	The GetFeasibility operation should return the acquisitions matching the input tasking parameters by performing a search against the configured EOLI XML Catalogue.	n/a
SR-OPGW-FN-130	GetFeasibility operation: A tasking request shall be considered feasible if at least one acquisition matches the input parameters.	n/a



Source	Description (original text)	OPGW Requirement
SR-OPGW-FN-140	GetFeasibility operation: It shall return a feasibilityID identifying the issued tasking request. This identifier can be re-used for submitting the programming request.	n/a
SR-OPGW-FN-150	GetFeasibility operation: OPGW shall support optimal area coverage for coverage orders by preparing an appropriate EOLI XML search to submit to the configured EOLI XML Catalogue server.	n/a
SR-OPGW-FN-160	Feasibility Analysis Display: OPGW shall provide a tool for converting the GetFeasibilityResponse messages in KML V2.2 files to be showed in Google Earth.	n/a
SR-OPGW-FN-170	The Submit operation shall support Programming request specified by both the feasibilityID and the list of parameters.	n/a
SR-OPGW-FN-180	The Submit operation shall notify the client of the completion of the request by calling its SubmitResponse operation.	n/a
IDS-FN-1000	The POMS engine of M2CS component (formerly MUIS – IDS) shall support optimal area coverage.	n/a
SR-OPGW-PR-010	In case of requests which need not negligible computation within the OPGW i.e.: <ul style="list-style-type: none"> <li>Programming::GetFeasibility</li> <li>Programming::Submit</li> </ul> the response time shall be: Total Response Time < 10 seconds + Time Spent by ESA GS to process the EOLI requests.	n/a
SR-OPGW-IF-070	In Submit operation the following approach should be followed for setting the processing & programming fields of the EOLI XML orderItem element in case of joint Ordering & Programming services: <ul style="list-style-type: none"> <li>processing options are taken by the HMA Ordering Submit operation.</li> </ul> programming options are taken by the linked HMA Programming GetFeasibility operation.	n/a



Source	Description (original text)	OPGW Requirement
SR-OPGW-IF-120	Because order cancellation is not supported on-line by ESA / GS, then the Cancel operation does nothing and the response message shall be set in this way: <ul style="list-style-type: none"> <li>• status = incomplete;</li> <li>• errorMessage = "please contact order desk to cancel";</li> </ul>	n/a
SR-OPGW-IF-300	The OPGW shall provide access to the Ordering of future products Functionality of ESA MM GS through interfaces compliant with both HMA Ordering ICD [AD-5] and HMA Programming ICD [AD-7].	n/a
SR-OPGW-IF-310	To support HMA Programming ICD [AD-7], the OPGW shall implement the following operations: <ul style="list-style-type: none"> <li>• GetCapabilities</li> <li>• DescribeGetFeasibility</li> <li>• DescribeSubmit</li> <li>• GetFeasibility</li> <li>• Submit</li> <li>• GetStatus</li> </ul>	n/a
SR-OPGW-IF-320	The Capabilities data returned by GetCapabilities operation shall be extracted by the repository of OPGW configuration data.	n/a
SR-OPGW-IF-330	The tasking parameters returned by DescribeGetFeasibility & DescribeSubmit operation should be retrieved from: <ul style="list-style-type: none"> <li>• Preconfigured XML files</li> </ul>	n/a
SR-OPGW-IF-340	The collectionId field to specify in processPresentationRequest shall be set translating the sensorIdentifier specified in DescribeGetFeasibility / DescribeSubmit using a configuration table.	n/a
SR-OPGW-IF-350	GetFeasibility The search request issued towards ESA EOLI XML Catalogue shall be formatted following the rules specified in §5.3.6 [AD-8].	n/a
SR-OPGW-IF-360	GetFeasibility The response message shall be formatted following the rules specified in §5.3.6 [AD-8].	n/a
SR-OPGW-IF-370	In Submit operation, for the management of asynchronous notifications, only the finalisation of the submitted programming request shall be notified.	n/a



Source	Description (original text)	OPGW Requirement
SR-OPGW-IF-380	<p>Because order cancellation is not supported on-line by ESA / GS, then the Cancel operation does nothing and the response message shall be set in this way:</p> <ul style="list-style-type: none"> <li>taskID = taskID of the request;</li> <li>requestStatus = "rejected"</li> <li>description = "please contact order desk to cancel";</li> </ul>	n/a
SR-OPGW-IF-390	<p>GetStatus</p> <p>OPGW shall support GetStatus operation according to HMA Programming ICD [AD-7].</p>	n/a
SR-OPGW-IF-400	<p>GetStatus operation shall be implemented by calling the processOrderMonitorRequest operation of EOLI XML Ordering Server mapping the HMA Ordering request and response messages on the EOLI XML request and response messages according to the table at §5.3.9 [AD-8].</p>	n/a

**Table 7-2: HMA-E OPGW requirements not applicable to HMA FO Task 4 OPGW.**





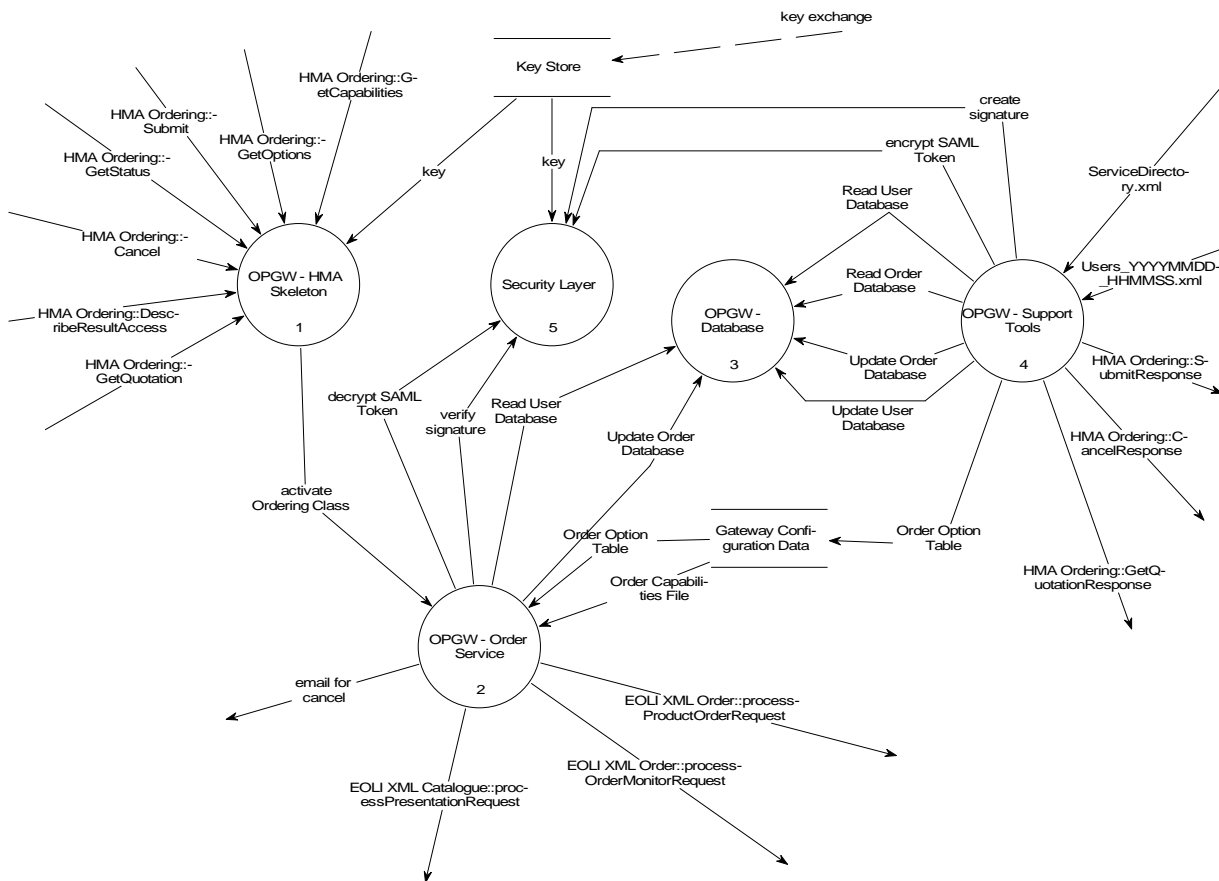
## 8 LOGICAL MODEL DESCRIPTION

This section presents a technical specification of system, independent of the implementation, describing the functional behaviour of the software product.

OPGW system is in charge of providing the following main functionalities:

- Checking the identity of the issuer of the requests according to the DAIL UM ICD [AD-11];
- Supporting the HMA Ordering ICD to return ordering options, to submit or cancel product orders (supporting possible async notification), to perform order monitoring.

The following figure reports the first level decomposition of the OPGW in functional sub-components.



**Figure 8-1: OPGW first level decomposition.**

The OPGW is structured in the following sub-components:

**- OPGW - HMA Skeleton [RD-1]**

This is the framework where the other sub-components run. It is in charge of:

- listening incoming SOAP requests issued via HTTP protocol;
- parse the input SOAP messages;



- understanding the correct object to activate;

Other special functionalities are:

- the Skeleton can work as a server accepting requests and returning back predefined answers specified within test procedures.
- the Skeleton includes test pages able to call the HMA Ordering interfaces provided by GSs Services.
- The Skeleton can insert new services just by adding new java classes implementing the operations of the services to add and properly configuring the Skeleton. This capability of hosting new services by updating configuration files and deploying suitable java classes has been used for implementing OPGW services.

#### - **OPGW - Database**

Package including the RDBMS (HSQLDB) and the Java library in charge of providing the functions for querying and storing permanently: users and orders.

#### - **OPGW - Order Service**

It is a set of java classes deployed on the Skeleton that are in charge of managing the operations defined in HMA Ordering ICD so it shall be able to manage the following operations:

- GetCapabilities.
- GetOptions.
- GetQuotation.
- Submit.
- GetStatus.
- Cancel.
- DescribeResultAccess.

Because the similarity between the HMA Ordering interfaces and the EOLI XML Order ICD interfaces, then this component works mainly translating the HMA requests in EOLI XML requests and translating back the EOLI XML response in HMA responses.

#### - **Support Tools**

This is a set of Java classes providing the functionalities needed by OPGW:

- Tool for converting the order options of ServiceDirectory.xml
- SOAP client tool for testing the system.
- Asynchronous notification: it includes Java stand alone applications for sending the notifications of asynchronous operations.

#### - **Security Layer**

This is a set of java classes in charge of performing encryption, decryption, digital signature preparation and verification of SAML Tokens.

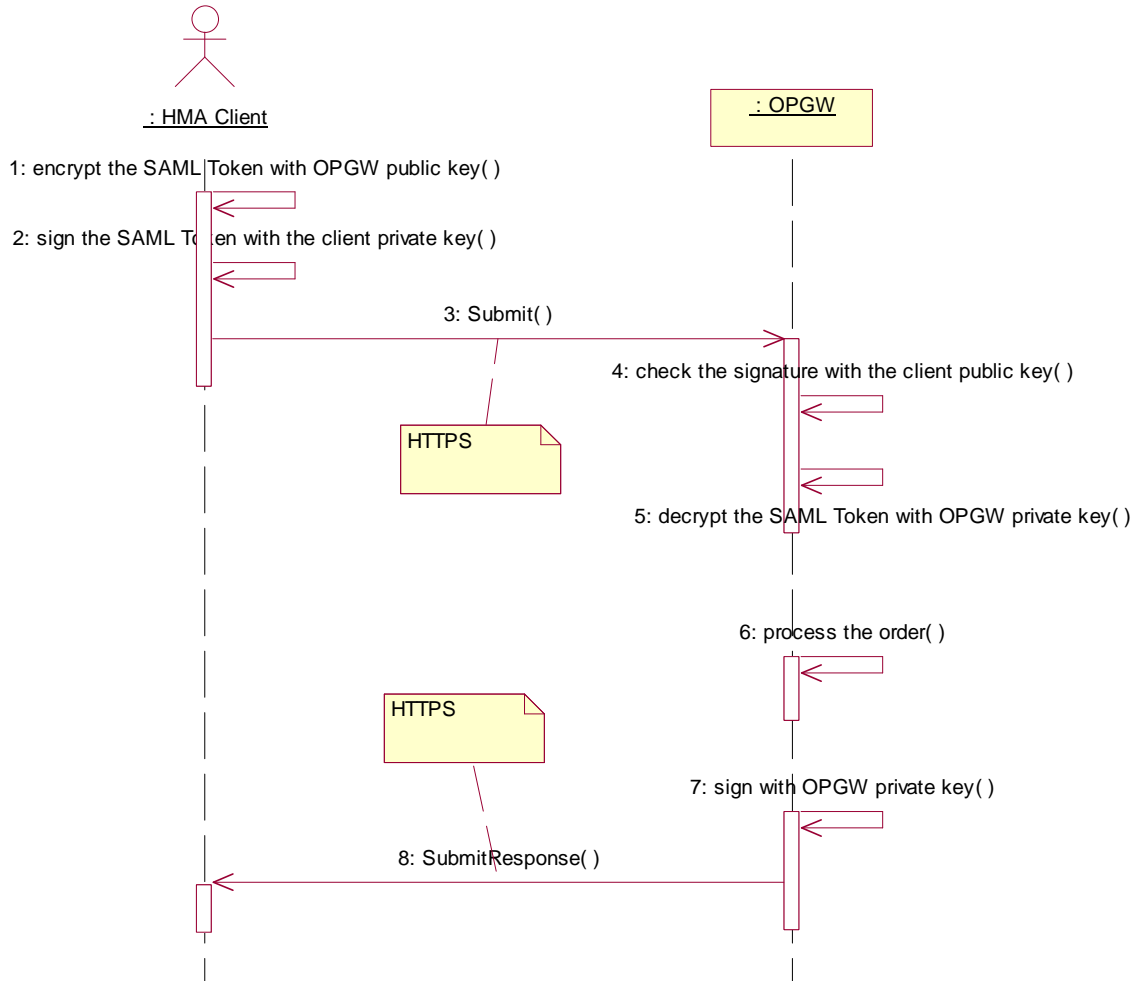


## 8.1 OPGW Scenarios

The following section summarizes the main scenarios for accessing and operating the system.

### 8.1.1 Identity Management Scenario

From [RD-4], the interaction between the HMA Client and the OPGW can be summarized in this way:



**Figure 8-2: General Handling of HMA requests scenario.**

- The HMA client generates a request for OPGW. The OPGW is called on **HTTPS channel**, including the **encrypted SAML Token** in the SOAP header and the service request in the SOAP body. The **SAML Token includes the attributes of the minimum profile** [AD-11], which includes at least:
  - HMA user identifier



- Country of origin
- Organisation
- Names of projects with which user is affiliated.
- The HMA account number
- The OPGW performs decryption and checking of signature, extract the minimum profile from the SAML Token, then process the request.

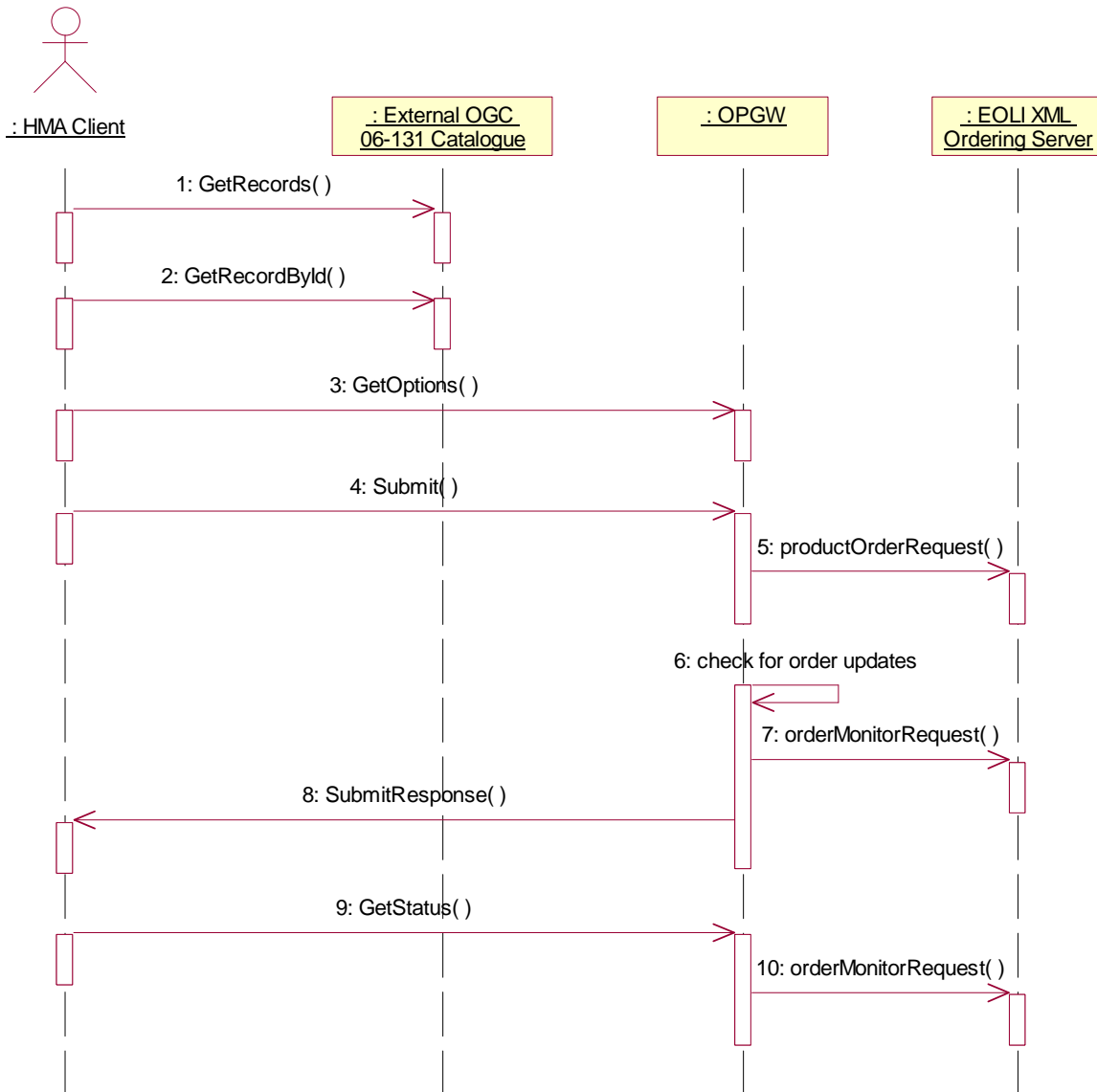
OPGW does not perform any authorization checks on the requests (possible restrictions are applied from the EOLI XML Order Server on the order translated from OPGW).

The second part of the scenario describes the asynchronous notification, which is possible in case of order submission. For sending the notification it is sufficient signing the message with the private key of the sender (i.e. OPGW) and sending the message via HTTPS. The DAIL, using the public key of the sender (OPGW) will check the signature: if the check is OK, then the HMA Client is sure that the sender is actually what it claims to be.



### 8.1.2 Product Ordering Scenario

This scenario summarizes all the interactions between HMA Client, OPGW, the companion OGC 06-131 Catalogue and the EOLI XML Ordering Server (i.e. MUIS – DSM or M2EOS + MMOHS).



**Figure 8-3: EO Products ordering scenario**

This scenario does not show the steps related to identity management (see §8.1.1).

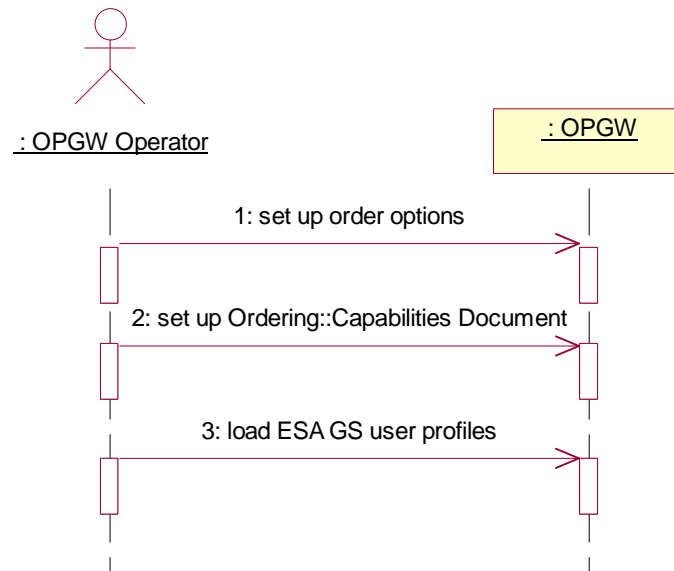
**Description:**



1. The HMA Client issues a query to the External OGC 06-131 Catalogue, via calling the GetRecords operation and then (optionally) GetRecordById operation.
2. Once a catalogue item has been selected, the following actions are performed for ordering the product:
  - The HMA Client calls the GetOptions on the chosen catalogue item
  - The OPGW returns the set of preconfigured options
  - From the HMA Client the user fills in all needed order options and submits the order. The HMA Client specifies to receive the notification on order completion.
  - The OPGW formats an EOLI XML Ordering request according to the input request and then send it to the EOLI XML Ordering server.
  - Because EOLI XML does not support asynchronous notification, then the OPGW performs polling on the status of the submitted order waiting for the order completion.
  - When the order is completed the order notification is sent to the HMA Client.
  - The HMA Client can ask also the status of the order calling the GetStatus operation.

### 8.1.3 Configuration Scenario

This scenario describes the main information items to be configured in OPGW.



**Figure 8-4: OPGW Configuration scenario.**

As highlighted in the diagram:

- The answers to GetCapabilities (Capabilities documents) are preconfigured;
- Order options are preconfigured by accessing the configuration file, ServiceDirectory.xml.



## 9 MAPPING OF HMA ICD WITH RESPECT TO EOLI XML ICD

The following sections specify the mapping of HMA ICDs on EOLI XML Ordering ICD.

For each operation a pair of tables is provided specifying the translation of HMA requests in the EOLI XML interfaces requests and the translation of the responses in HMA responses.

Before starting with the explanation of attributes mapping, the usage of the Ordering ICD is briefly summarized.

### 9.1 Ordering ICD overview

The Ordering ICD [AD-5] is in charge of allowing clients getting EO products from catalogue and it supports the following types of orders:

- Order from catalogues of EO products.  
This service allows the preparation and the submission of an order including products identified via a search in a catalogue of EO products.
- Order of products derived from a programming request.  
This service allows the submission of an order including products which can be derived from a set of future acquisition segments specified via a Programming Service (see previous section).
- Subscription to EO products.  
This service allows users the periodical reception of products of interest on the areas of interest whenever they become available in the catalogue. With respect to the previous type of requests, no mission planning activity is triggered and the client will receive the data that someone else (the ground segment mission planners) has planned.

The Ordering ICD specifies the following operations:

- **GetCapabilities**, which allows a client to request and receive service metadata (or Capabilities) documents that describe the abilities of the specific server implementation.
- **GetOptions**, which allows clients to retrieve the options for issuing an order:
  - in case of product ordering it returns the options for ordering a specific type of product;
  - in case of subscriptions it returns the possible parameters to set for specifying the scope of the subscription (e.g.: area of interest, expiration date, etc.);
  - in case of embedded programming requests, it returns the options available for the specified programming request.
- **GetQuotation**, which allows the client to get a quotation either of the order that is going to be submitted or of the subscription going to be subscribed.
- **Submit**, which allows either submitting an order of products (from EO catalogue or from a programming request) or for subscribing to a subscription. This operation is asynchronous and then the client has to implement a call-back operation (**SubmitResponse**) for receiving the result of the operation.
- **DescribeResultAccess**, which allows accessing the products ordered with on-line delivery.
- **GetStatus**, which allows to retrieve either the status of submitted orders or the status of subscribed subscriptions.
- **Cancel**, which allows either to ask the cancellation of an already submitted order or to unsubscribe a subscription. This operation is asynchronous and then the client has to



implement a call-back operation (**CancelResponse**) for receiving the result of the operation.

## 9.2 Mapping HMA Ordering ICD operations & attributes on EOLI XML Order ICD [AD-6] operations and messages.

The HMA Ordering ICD is implemented by a gateway that translates the incoming requests in EOLI XML Ordering ICD compliant requests. This section specifies how the mapping between the two ICDs has been accomplished.

For each operation, a table specifying how the EOLI XML request is built from the HMA request and then a table specifying how the HMA response is built from the EOLI XML response are provided.

### 9.2.1 HMA Ordering ICD GetCapabilities mapping

GetCapabilities has not any correspondence with EOLI XML Order ICD [AD-6], so the operation is not translated, but implemented natively within the gateway.

The following tables specify how the GetCapabilities request & response parameters are managed.

GetCapabilities attributes	Comment
Service	Always set with "OS"
updateSequence	Not supported by server and then it returns the whole service metadata document.

**Table 9-1: HMA Ordering - GetCapabilities attributes mapping.**

GetCapabilities elements	Comment
ows:AcceptVersions	Optional; Prioritized sequence of one or more specification versions accepted by client, with preferred versions listed first. Value is list of x.y.z "version" values
ows:Sections	Not supported The server returns complete service metadata document
ows:AcceptFormats	Not supported The server returns service metadata document using MIME type "text/xml"

**Table 9-2: HMA Ordering - GetCapabilities elements mapping.**

Capabilities attributes	Comment
Version	Mandatory
updateSequence	Not supported.

**Table 9-3: HMA Ordering - Capabilities attributes mapping.**





Capabilities elements	Comment
ServiceIdentification	To set with fixed data hosted on a configuration file.
ServiceProvider	To set with fixed data hosted on a configuration file.
OperationsMetadata	To set with fixed data hosted on a configuration file.
Contents	
ProductOrders	
supported	Set to true
SubscriptionOrders	
supported	Set to true
ProgrammingOrders	
supported	Set to false  In this HMA FO implementation there is no longer an SPS, and then the joined ordering & programming scenario is no longer supported.
SPS_URL	Empty
GetQuotationCapabilities	
supported	Set to true
synchronous	Set to false
asynchronous	Set to true
monitoring	Set to false
off-line	Set to false
SubmitCapabilities	
asynchronous	Set to true
maxNumberOfProducts	Set to 20 (it is the current operational limit)
globalDeliveryOptions	Set to true
localDeliveryOptions	Set to true
GetStatusCapabilities	
supported	Set to true
orderSearch	Set to true
orderRetrieve	Set to true
full	Set to true
DescribeResultAccessCapabilities	
supported	Set to true
CancelCapabilities	
supported	Set to true
asynchronous	Set to true
SupportedCollections	
collectionId	List of collections supported for ordering; see Table 9-5.

Table 9-4: HMA Ordering - Capabilities element mapping.

CollectionId	Comment
ESA.EECF.ENVISAT_ASA_APx_xS	Envisat ASAR Alternate Polarization Stripline. It includes all ASAR alternate polarization products.
ESA.EECF.ENVISAT_ASA_APx_xF	Envisat ASAR Alternate Polarization Frame It includes all ASAR alternate polarization products.
ESA.EECF.ENVISAT_ASA_IMx_xS	Envisat ASAR Image Mode Pass
ESA.EECF.ENVISAT_ASA_IMx_xF	Envisat ASAR Image Mode Frame
ESA.EECF.ENVISAT_ASA_WSx_xS	Envisat ASAR Wide Swath Pass
ESA.EECF.ENVISAT_ASA_WSx_xF	Envisat ASAR Wide Swath Frame
ESA.EECF.ENVISAT_MER_RR_xS	Envisat MERIS Reduced Resolution Pass
ESA.EECF.ENVISAT_MER_RR_xF	Envisat MERIS Reduced Resolution Frame



CollectionId	Comment
ESA.EECF.ENVISAT_MER_FR_xS	Envisat MERIS Full Resolution Pass
ESA.EECF.ENVISAT_MER_FR_xF	Envisat MERIS Full Resolution Frame
ESA.EECF.SPOT_ESA_PAN	SPOT Panchromatic: L1A (ESA)
ESA.EECF.SPOT_ESA_MULTI	SPOT Multispectral: L1A (ESA)

Table 9-5: List of configured collections.

## 9.2.2 HMA Ordering ICD GetOptions mapping

The retrieval of ordering options is supported by both ICDs:

- GetOptions operation for HMA Ordering ICD;
- processPresentationRequest with presentation "orderOptions" for EOLI XML Order ICD [AD-6].

However the get option capability has not been actually used in operation: the ESA User Service client, EOLI SA, already knows all ordering options via configuration file (ServiceDirectory.xml). Then the proposed approach is to extract order options from that file and to prepare off-line a valid OrderOptionsResponseType to return as GetOrderOption response element.

GetOptions returns order options for the following types of requests:

- orders for archived products

In this case the input message specifies the collection id and the catalogue identifier of the product. Because all archived products of a collection have the same order options, then the selection of options is done considering only the collection identifier and mapping it on the corresponding MUIS product type.

- Subscriptions

This function is not supported by MUIS, but it will be supported by M2EOS and the new MMOHS, then OPGW will allow accessing of subscription function.

Because these options are not specified in the Service Directory XML file, then these options have to be manually configured by the OPGW operator.

The following table shows how OrderOptionsResponseType is set starting from EOLI SA information.

HMA Ordering Tag Name	HMA Ordering Tag Value
status	
errorMessage	
productOrderOptions	Subscriptions are not managed
productOrderOptionsId	Set getting parameters from:  ServiceDirectory.xml/OrderOptions/Service/[Name = EECF]/ ProviderOrderOptionsGroup/PlatformOrderOptionGroup/SensorOrderO ptionGroup/OrderOptionGroup/OrderOptionGroupName
Description	Empty
orderType	PRODUCT_ORDER
	On EOLI SA configuration only Product options can be found.



HMA Ordering Tag Name	HMA Ordering Tag Value
options	Set getting parameters from: <ul style="list-style-type: none"> <li>ServiceDirectory.xml/OrderOptions/Service/[Name = EECF]/ProviderOrderOptionsGroup/PlatformOrderOptionGroup/SensorOrderOptionGroup/OrderOptionGroup/ProcessingOption</li> </ul> See Table 9-7 for the list of possible ordering options.
productDeliveryOptions	Set getting parameters from: <ul style="list-style-type: none"> <li>ServiceDirectory.xml/OrderOptions/Service/[Name = EECF]/ProviderOrderOptionsGroup/PlatformOrderOptionGroup/SensorOrderOptionGroup/OrderOptionGroup/DeliveryOption</li> </ul>
orderOptionInfoURL	Empty
paymentOptions	
paymentMethod	Fixed value: "quota"
sceneSelectionOption	Set getting parameters from: <ul style="list-style-type: none"> <li>ServiceDirectory.xml/OrderOptions/Service/[Name = EECF]/ProviderOrderOptionsGroup/PlatformOrderOptionGroup/SensorOrderOptionGroup/OrderOptionGroup/SceneSelectionOption</li> </ul>

Table 9-6: HMA Ordering/GetOptionsResponse

The following table specifies the list of envisaged order options.

Ordering Parameter Name	Description	Mandatory / Multiplicity	Acquisition Order	Coverage Order	Standing Order
processingLevel	Level of processing required on the required data. E.g.: ASA_IMM_1P, MER_RR__2P, ..	M 1	Y	Y	Y
SpotProcessing					
Format_SPOT					
format	Product format e.g.: CEOS, ESA, ..	O 1	Y	Y	Y

Table 9-7: List of ordering parameters.

Ordering Parameter Name	Mandatory / Multiplicity	ENVISAT:A SAR:IM	ENVISAT:AS AR:AP	ENVISAT:ASAR:WS	ENVISAT:MERIS:RR	ENVISAT:MERIS:FR
processingLevel	M 1	Y	Y	Y	Y	Y
format	n/a	n/a	n/a	n/a	n/a	n/a

Table 9-8: Sensor vs. ordering parameters.



### 9.2.3 HMA Ordering ICD GetQuotation mapping

The ESA / GS does not support quotation of orders and EOLI XML Order ICD [AD-6] does not provide such operation and then no mapping is possible. Nevertheless, in order to allow the clients to test this function, then OPGW will simulate this function:

- OPGW will support async quotation (it is the most complex scenario)
- The order to be quoted is stored in the DB for later re-use of the parameters in the Submit operation.
- An order quotation, generated internally by OPGW, is formatted and sent to the client. Of course it is just for testing purposes, it is not the actual quote of the order.

### 9.2.4 HMA Ordering ICD Submit mapping

The Submit operation is in charge of submitting the following type of requests:

- orders for products from archive  
In this case the request can be easily translated in the corresponding EOLI XML Order one [AD-6].
- Subscriptions  
This function is not currently supported (MUIS), but it will be supported in the new M2EOS system that is going to replace it. OPGW will allow access to this function.

The following tables specify how the EOLI XML request is built from the HMA request and then how the HMA response is built from the EOLI XML response.

#### 9.2.4.1 Orders for archived products

The following tables specify the preparation of EOLI XML Product Order Request message for submitting an order for products from archive.

EOLI XML Tag Name	EOLI XML Tag Value
ProductOrderRequest	
userInformation	From SOAP Header of HMA Submit request
orderSpecification	
orderAccount	Derived by HMA Ordering/Submit/orderSpecification/orderItem/payment/orderAccount  If the orderAccount is defined in the user profile, then it is used; If the orderAccount is not defined in the user profile, then one of the possible orderAccounts is used.
orderReference	It is set with a special value for flagging the OPGW orders: <ul style="list-style-type: none"> <li>• OPGW_PAST_ORDER: for order of archived products</li> <li>• OPGW_FUTURE_ORDER: for orders of future products specified in join with the Programming Interface</li> <li>• OPGW_ACQ_REQUEST: for acquisition orders (issued via the Programming Service and not via the Ordering Service)</li> <li>• OPGW_SUBSCRIPTION</li> </ul>
orderRemark	HMA Ordering/Submit/orderSpecification/orderRemark
deliveryInformation	Retrieved from the User Profile stored in the User Database. In case of orders with on-line delivery, the e-mail address is also added.



EOLI XML Tag Name	EOLI XML Tag Value
orderItem	See Table 9-10.

**Table 9-9: EOLI XML Order/processProductOrderRequest setting (order of products from archive)**

EOLI XML Tag Name	EOLI XML Tag Value
orderItemId	HMA Ordering/Submit/orderSpecification/orderItem/itemId
productId	
idCitation	
resTitle	<p>Prepare the resTitle starting from the HMA order item identifier: HMA Ordering/Submit/orderSpecification/orderItem/productId/identifier</p> <p>The HMA identifier has several tokens separated with ":" and the EOLI XML resTitle as the last token. Then the EOLI resTitle is retrieved by getting the last token within the identifier.</p> <p>It is not set in case of subscriptions.</p>
collectionId	<p>Prepare the collectionId from the HMA collection identifier: HMA Ordering/Submit/orderSpecification/orderItem/productId/collectionId</p> <p>The collection id of the strip collection must be specified. In case of strip collection, the collection id is passed as it is; in case of frame based collections the collection id is automatically changed in this way: the trailing _xF part is replaced with _xS. This is because the naming convention:</p> <ul style="list-style-type: none"> <li>• strip collections are ending with "_xS"</li> <li>• frame collections are ending with "_xF"</li> </ul> <p>In case of subscription it is extracted from collection id of the incoming order by stripping the urn:ogc... prefix.</p>
processing	<p>HMA Ordering/Submit/orderSpecification/orderItem/options</p> <p><b>Note:</b> HMA ICD options based on SWE Common shall be translated in the corresponding EOLI XML name and value pairs.</p> <p>Due to the collections that have to be managed only the 2 following order options are supported:</p> <ul style="list-style-type: none"> <li>• processingLevel (HMA) → Processing (EOLI)</li> <li>• format (HMA) → Format (EOLI)</li> </ul>
programming	Empty
sceneSelection	<p>Derived by HMA Ordering/Submit/orderSpecification/orderItem/sceneSelection</p> <p>Because the client is not able to set the coordinates of the scene, then only the Temporal Selection is supported. If the temporal selection is not provided, then it is automatically set extracting the times from the resTitle.</p> <p>Empty in case of subscriptions.</p>



EOLI XML Tag Name	EOLI XML Tag Value
deliveryMethod	HMA Ordering/Submit/orderSpecification/orderItem/deliveryMethod  Or in case of global delivery options:  HMA Ordering/Submit/orderSpecification/deliveryOptions/deliveryMethod  MAIL and FTP methods are supported.
packageMedium	HMA Ordering/Submit/orderSpecification/orderItem/packageMedium  Or in case of global delivery options:  HMA Ordering/Submit/orderSpecification/deliveryOptions/packageMedium
qualityOfService	HMA Ordering/Submit/orderSpecification/orderItem/options  It is derived by the priority: FAST_TRACK (HMA) → RUSH (EOLI) STANDARD (HMA) → STANDARD (EOLI)
orderItemRemark	HMA Ordering/Submit/orderSpecification/orderItem/orderItemRemark

**Table 9-10: EOLI XML Order/orderItem setting (order of products from archive)**

### 9.2.4.2 Asynchronous notification parameters

The HMA Ordering Submit specifies some attributes that are not supported by EOLI XML Order ICD [AD-8]:

- WS-Addressing header:
  - wsa:ReplyTo
  - wsa:MessageID
- statusNotification

these attributes are used for managing asynchronous notifications after order submission. The asynchronous mechanism is implemented by the Gateway and above attributes are managed by it.

HMA Ordering Tag Name	HMA Ordering Tag Value
SubmitAck	
status	EOLI XML Order/orderResponse/status
errorMessage	EOLI XML Order/orderResponse/errorMessage
orderId	EOLI XML Order/orderResponse/orderId
orderReference	EOLI XML Order/orderResponse/orderReference

**Table 9-11: HMA Ordering/SubmitAck vs. EOLI XML Order/orderResponse.**

### 9.2.5 HMA Ordering ICD SubmitResponse mapping

The SubmitResponse is supported by OPGW for sending status notifications after Submit activation and not for accepting these requests from clients.



The data sent to the client is got by calling the order monitor function of EOLI XML Order ICD [AD-6] and then the HMA Ordering ICD SubmitResponse has to be built from EOLI XML Order OrderMonitorResponse. Because the HMA Ordering ICD SubmitResponse is almost identical to HMA Ordering ICD GetStatusResponse then the Table 9-13 and Table 9-14 are applicable also the current case.

## 9.2.6 HMA Ordering ICD GetStatus mapping

The monitoring of order status is supported by both ICDs:

- GetStatus operation for HMA Ordering ICD;
- processOrderMonitorRequest for EOLI XML Order ICD [AD-8].

The following tables specify how the EOLI XML request is built from the HMA request and then how the HMA response is built from the EOLI XML response.

EOLI XML Tag Name	EOLI XML Order Tag Value
orderMonitorRequest	
userInformation	From SOAP Header of HMA GetStatus request
orderSpecification	
orderId	HMA Ordering/GetStatus/orderId
orderAccount	Empty
orderType	Empty
orderState	HMA Ordering/GetStatus/filteringCriteria/orderState
lastUpdate	HMA Ordering/GetStatus/filteringCriteria/lastUpdate
presentation	HMA Ordering/GetStatus/presentation

**Table 9-12: EOLI XML Order/orderMonitorRequest vs. HMA Ordering/GetStatus.**

HMA Ordering Tag Name	HMA Ordering Tag Value
GetStatusResponse	
status	EOLI XML Order/orderMonitorResponse/status
ErrorMessage	EOLI XML Order/orderMonitorResponse/ErrorMessage
orderMonitorSpecification	
orderReference	EOLI XML Order/orderMonitorResponse/orderSpecification/orderReference
orderRemark	EOLI XML Order/orderMonitorResponse/orderSpecification/orderRemark
deliveryInformation	EOLI XML Order/orderMonitorResponse/orderSpecification/deliveryInformation
invoiceAddress	Not set because not available from EOLI XML
Packaging	Empty
deliveryOptions	This element must be set in case of global delivery options (it is set in the OPGW DB at the time of receiving the Submit operation. However the information are extracted from the following EOLI XML response (which is at order item level) elements:  EOLI XML Order/orderMonitorResponse/orderSpecification/orderItem/deliveryMethod  EOLI XML Order/orderMonitorResponse/orderSpecification/orderItem/packageMedium



HMA Ordering Tag Name	HMA Ordering Tag Value																
Priority	Derived from QualityOfService																
orderType	Fixed to "PRODUCT_ORDER"																
orderId	EOLI XML Order/orderMonitorResponse/orderSpecification/orderId																
orderStatusInfo	EOLI XML Order/orderMonitorResponse/orderSpecification/orderStatusInfo																
status	To set mapping the values in EOLI XML Order/orderMonitorResponse/orderStatusInfo/orderState  According the following table:																
	<table border="1"> <thead> <tr> <th>HMA</th> <th>EOLI</th> </tr> </thead> <tbody> <tr> <td>Cancelled</td> <td>Cancelled</td> </tr> <tr> <td>Completed</td> <td>Completed</td> </tr> <tr> <td>Suspended</td> <td>Deleted (accepted, but acquisition or Production Failed),</td> </tr> <tr> <td>Accepted</td> <td>BeingQuoted (submitted by the user, in the process of being accepted by the provider)</td> </tr> <tr> <td>InProduction</td> <td>BeingProcessed (accepted, production ongoing)</td> </tr> <tr> <td>Failed</td> <td>NotValid (Validation Failed, not accepted)</td> </tr> <tr> <td>Downloaded</td> <td>This status is set only for orders with on-line delivery. These orders are simulated by OPGW itself and not implemented via translation to EOLI XML Order.</td> </tr> </tbody> </table>	HMA	EOLI	Cancelled	Cancelled	Completed	Completed	Suspended	Deleted (accepted, but acquisition or Production Failed),	Accepted	BeingQuoted (submitted by the user, in the process of being accepted by the provider)	InProduction	BeingProcessed (accepted, production ongoing)	Failed	NotValid (Validation Failed, not accepted)	Downloaded	This status is set only for orders with on-line delivery. These orders are simulated by OPGW itself and not implemented via translation to EOLI XML Order.
HMA	EOLI																
Cancelled	Cancelled																
Completed	Completed																
Suspended	Deleted (accepted, but acquisition or Production Failed),																
Accepted	BeingQuoted (submitted by the user, in the process of being accepted by the provider)																
InProduction	BeingProcessed (accepted, production ongoing)																
Failed	NotValid (Validation Failed, not accepted)																
Downloaded	This status is set only for orders with on-line delivery. These orders are simulated by OPGW itself and not implemented via translation to EOLI XML Order.																
additionalStatusInfo	EOLI XML Order/orderMonitorResponse/orderStatusInfo/additionalStatusInfo																
missionSpecificStatusInfo	Empty																
orderDateTime	EOLI XML Order/orderMonitorResponse/orderSpecification/orderDateTime																
orderItem	See Table 9-14.																

**Table 9-13: HMA Ordering/GetStatusResponse vs. EOLI XML Order/orderMonitorResponse.**

HMA Ordering Tag Name	Tag Description
itemId	EOLI XML Order/orderMonitorResponse/orderSpecification/orderItem/orderItemId
productOrderOptionsId	Empty
orderItemRemark	EOLI XML Order/orderMonitorResponse/orderSpecification/orderItem/orderItemRemark
options	EOLI XML Order/orderMonitorResponse/orderSpecification/orderItem/processingOptions & EOLI XML Order/orderMonitorResponse/orderSpecification/orderItem/programmingOptions
sceneSelection	EOLI XML Order/orderMonitorResponse/orderSpecification/orderItem/sceneSelection  All sub-fields are managed
deliveryMethod	EOLI XML Order/orderMonitorResponse/orderSpecification/orderItem/deliveryMethod





HMA Ordering Tag Name	Tag Description
packageMedium	EOLI XML Order/orderMonitorResponse/orderSpecification/orderItem/packageMedium
numberOfCopies	Empty
payment	By quota
orderAccount	EOLI XML Order/orderMonitorResponse/orderSpecification/orderAccount
productId	Depending on the input request there are 2 possibilities: <ul style="list-style-type: none"> <li>Order for products from archive: The identifier and collection is taken from EOLI XML Order</li> <li>Order for future products: In this case the SPS:ID linked to the submitted order shall be returned.</li> </ul>
identifier	EOLI XML Order/orderMonitorResponse/orderSpecification/orderItem/productId/idCitation/resTitle
collectionId	EOLI XML Order/orderMonitorResponse/orderSpecification/orderItem/productId/collectionId
taskingRequestId	SPS:ID of the linked programming request (stored in DB).
orderItemStatusInfo	In case of orders for future products, the status of the whole order is reported (infact the order item is a single SPS:ID)
orderState	See orderState mapping at Table 9-13
additionalStatusInfo	EOLI XML Order/orderMonitorResponse/orderSpecification/orderItem/orderItemStatusInfo/additionalStatusInfo

**Table 9-14: HMA Ordering/GetStatusResponse/orderSpecification/orderItem vs. EOLI XML Order/orderMonitorResponse/orderSpecification/orderItem**

### 9.2.7 HMA Ordering ICD Cancel mapping

The ESA / GS does not support cancellation of orders and EOLI XML Order ICD [AD-6] does not provide such operation and then no mapping possible, however, in order to allow the clients to test this function, OPGW will simulate it in this way:

- An e-mail is prepared and sent automatically to the ESA User Service Order Desk asking for the cancellation of the order.
- Then, upon operator intervention, the order is cancelled and then the order will be flagged as deleted on the EOLI XML Order.
- The async CancelResponse will be sent when the order has been reached the deleted status.

### 9.2.8 HMA Ordering ICD DescribeResultAccess mapping

This functionality is simulated putting a fixed file in a suitable directory and the corresponding URL is returned to the client for downloading the file.

