



EUROCONTROL Specification for Surveillance Data Exchange ASTERIX

Part 15 Category 065 SDPS Service Status Reports

Edition: 1.6
Edition date: 21-03-2023
Classification: White
Reference nr: EUROCONTROL-SPEC-0149-15



EUROCONTROL Specification for Surveillance Data Exchange ASTERIX Part 15 Category 65 SDPS Service Status Reports

DOCUMENT IDENTIFIER : EUROCONTROL-SPEC-0149-15

Edition Number	:	1.6
Edition Date	:	21/03/2023
Status	:	Released Issue
Intended for	:	General Public
Category	:	EUROCONTROL Specification

DOCUMENT CHARACTERISTICS

TITLE			
EUROCONTROL Specification for Surveillance Data Exchange – ASTERIX Part 15			
Category 065: SDPS Service Status Reports			
Publications Reference:		SPEC-0149-15	
		ISBN Number:	978-2-87497-028-3
Document Identifier		Edition Number:	1.6
EUROCONTROL-SPEC-0149-15		Edition Date:	21/03/2023
Abstract			
<p>This document specifies the contents of ASTERIX Category 065 reports used for the transmission of Service Status Reports generated by an SDPS.</p> <p>Data Item I065/REF/ARL “ASTERIX Record Length”, which was defined in the REF Edition 1.1, is no longer used. However, since I065/REF/ARL is a mandatory Data Item, the use of the Reserved Expansion Field is mandatory for systems that support the REF following Edition 1.1 or higher. Implementation of the REF Edition 1.1 or higher needs to be carefully coordinated between all Users.</p>			
Keywords			
Data Exchange	Reports	SAC	SIC
Data Category	Data Field	Data Block	Data Item
ASTERIX	UAP	Service Status Messages	
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STATUS, AUDIENCE AND ACCESSIBILITY					
Status	Intended for			Accessible via	
Working Draft	<input type="checkbox"/>	General Public	<input checked="" type="checkbox"/>	Intranet	<input type="checkbox"/>
Draft	<input type="checkbox"/>	EUROCONTROL	<input type="checkbox"/>	Extranet	<input type="checkbox"/>
Proposed Issue	<input type="checkbox"/>	Restricted	<input type="checkbox"/>	Internet (www.eurocontrol.int)	<input checked="" type="checkbox"/>
Released Issue	<input checked="" type="checkbox"/>				

DOCUMENT APPROVAL

This document has been approved by the ASTERIX Maintenance Group (AMG).

For management approval of the complete set of ASTERIX documentation refer to Part 1.

DOCUMENT CHANGE RECORD

The following table records the complete history of the successive editions of the present document.

EDITION	DATE	REASON FOR CHANGE	SECTIONS PAGES AFFECTED
0.10	Oct. 2002	Creation of EUROCONTROL document from splitting former Cat 063 into Cat 063 and Cat 065	ALL
0.11	Dec. 2002	Editorial modifications Suppression of items I065/60, I065/61, I065/62	ALL
0.12	Mar. 2003	Modification of I065/040	5.2.14
1.0P	March 2004	Inversion of I065/000 and I065/010 in UAP	5.3
1.1	October 2004	Editorial Modification in I065/040	5.2.6
1.2	March 2005	Document Identification Sheet updated Document Approval Page updated	Page ii Page iii
1.3	April 2007	Document Identification Sheet updated Document Approval Page updated Number of message types corrected Reference to ASTERIX-website added	Page ii Page iii Page 11 5.2.2
1.4	Aug. 2014	EUROCONTROL Specification Template Document ID-Sheet updated Signature Page updated STTN-bit added to I 065/040	All Page ii Page iii 5.2.6
1.5	June 2020	Name for Message Type 3 corrected in table NOTE: this change is editorial only	5.2.1
1.6	March 2023	Table 1 removed Reference to I065/REF/ARL added	5.1 4.4 & 5.3

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TABLE OF CONTENTS

DOCUMENT CHARACTERISTICS	ii
DOCUMENT APPROVAL	iii
DOCUMENT CHANGE RECORD	iv
1. INTRODUCTION	1
1.1 Scope	1
2. References	2
2.1 General	2
2.2 Reference Documents	2
3. Definitions, acronyms and abbreviations	3
3.1 Definitions	3
3.2 Acronyms and Abbreviations	4
4. GENERAL PRINCIPLES	5
4.1 General	5
4.2 Time Management	5
4.3 Unused Bits in Data Items	5
4.4 User Application Profile and Data Blocks	6
4.5 Composition of Messages	6
5. LAYOUT OF MESSAGES	7
5.1 Standard Data Items	7
5.2 Description of Standard Data Items	8
5.2.1 Data Item I065/000, Message Type	8
5.2.2 Data Item I065/010, Data Source Identifier	10
5.2.3 Data Item I065/015, Service Identification	10
5.2.4 Data Item I065/020, Batch Number	11
5.2.5 Data Item I065/030, Time of Message	11
5.2.6 Data Item I065/040, SDPS Configuration and Status	12
5.2.7 Data Item I065/050, Service Status Report	13
5.3 User Application Profile for Category 065	14

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1. INTRODUCTION

1.1 Scope

This document describes the structure for the transmission of service status messages from an SDPS.

This document defines the data out of Category 065.

2. REFERENCES

2.1 General

The following Documents and Standards contain provisions which, through references in this text, constitute provisions of this EUROCONTROL Standard Document.

At the time of publication of this EUROCONTROL Standard Document, the editions indicated for the referenced documents and standards were valid.

Any revision of the referenced ICAO Documents shall be immediately taken into account to revise this EUROCONTROL Standard Document.

Revisions of the other referenced documents shall not form part of the provisions of this EUROCONTROL Standard Document until they are formally reviewed and incorporated into this EUROCONTROL Standard Document.

In the case of a conflict between the requirements of this EUROCONTROL Standard Document and the contents of the other referenced documents, this EUROCONTROL Standard Document shall take precedence.

2.2 Reference Documents

1. EUROCONTROL Specification SPEC-0149, edition 2.1, 14 April 2013 "EUROCONTROL Specification for Surveillance Data Exchange – Part 1 All Purpose Structured EUROCONTROL Surveillance Information Exchange – ASTERIX".

3. DEFINITIONS, ACRONYMS AND ABBREVIATIONS

3.1 Definitions

For the purposes of this EUROCONTROL Document, the following definitions shall apply:

- 3.1.1 Broadcast Service:** A service not needing a session establishment between a user and a SDPS.
- 3.1.2 Catalogue of Data Items:** List of all the possible Data Items of each Data Category describing the Data Items by their reference, structure, size and units (where applicable).
- 3.1.3 Data Block:** Unit of information seen by the application as a discrete entity by its contents. A Data Block contains one or more Record(s) containing data of the same category.
- 3.1.4 Data Category:** Classification of the data in order to permit inter alia an easy identification.
- 3.1.5 Data Field:** Physical implementation for the purpose of communication of a Data Item, it is associated with a unique Field Reference Number and is the smallest unit of transmitted information.
- 3.1.6 Data Item:** The smallest unit of information in each Data Category.
- 3.1.7 Record:** A collection of transmitted Data Fields of the same category preceded by a Field Specification field, signalling the presence/absence of the various Data Fields
- 3.1.8 Service:** An SDPS information service is uniquely identified by a service identification and is composed of a track element and a sensor element. A track element is characterised by the track selection (e.g. set of Mode-3/A codes, filtering in height, primary only, secondary only...), the track item selection (e.g. WGS-84 position, Time of Day...), the track transmission characteristics (e.g. synchronised on sensor, periodical, a-periodical event-triggered). A sensor element is characterised by the sensor selection, the sensor item selection, the sensor transmission characteristics.
- 3.1.9 Session:** Point to point connection between a user and a SDPS.
- 3.1.10 User Application Profile:** The mechanism for assigning Data Items to Data Fields, and containing all necessary information which needs to be standardised for the successful encoding and decoding of the messages.

3.2 Acronyms and Abbreviations

For the purposes of this EUROCONTROL Document, the following shall apply:

°	Degree (angle)
ADS-B	Automatic Dependent Surveillance - Broadcast
AMG	ASTERIX Maintenance Group
ASTERIX	All Purpose ST ructured EUROCONTROL su R veillance Information EX change
CAT	Data Category
EATMP	European Air Traffic Management Programme
FRN	Field Reference Number
FSPEC	Field Specification
FX	Field Extension Indicator
ICAO	International Civil Aviation Organization
LEN	Length Indicator
LSB	Least Significant Bit
PSR	Primary Surveillance Radar
RE	Reserved Expansion Indicator
REP	Field Repetition Indicator
s	second, unit of time
SAC	System Area Code
SDPS	Surveillance Data Processing System
SIC	System Identification Code
SP	Special Purpose Indicator
SSR	Secondary Surveillance Radar
SURT	Surveillance Team (EATMP)
UAP	User Application Profile (see Definitions)
UTC	Co-ordinated Universal Time
WGS-84	World Geodetic System 84

4. GENERAL PRINCIPLES

4.1 General

The transmission of SDPS Service Status Messages shall require the transmission of three types of messages :

- SDPS status,
- End of batch,
- Service Status report.

4.2 Time Management

The timestamping shall comply with ICAO Annex 5.

4.3 Unused Bits in Data Items.

Decoders of ASTERIX data shall never assume and rely on specific settings of spare or unused bits. However in order to improve the readability of binary dumps of ASTERIX records, it is recommended to set all spare bits to zero.

4.4 User Application Profile and Data Blocks

A single User Application Profile (UAP) is defined and shall be used for SDPS service messages.

Data Blocks shall have the following layout.

CAT = 065	LEN		FSPEC	Items of the first record		FSPEC	Items of the last record
------------------	------------	--	--------------	---------------------------	--	--------------	--------------------------

where:

- Data Category (CAT) = 065, is a one-octet field indicating that the Data Block contains SDPS status messages;
- Length Indicator (LEN) is a two-octet field indicating the total length in octets of the Data Block, including the CAT and LEN fields;
- FSPEC is the Field Specification.

The implementation of I065/REF/ARL “ASTERIX Record Length” was intended to allow the addition Data Items at the end of the UAP as defined in 5.3 below. However, given that such an extension potentially creates interoperability issues between systems not being updated to the latest edition of Category 065 and it’s Reserved Expansion Field, the AMG in it’s 18th meeting decided to not apply this concept and to no longer use I065/REF/ARL. However, for reasons of compatibility the Data Item I065/REF/ARL will be kept in the REF Specification. This has been documented in the Specification of the REF.

4.5 Composition of Messages

Messages shall be composed of Data Items assembled in the order defined by the Field Reference Number (FRN) in the associated UAP.

When sent, items shall always be transmitted in a Record with the corresponding FSPEC bits set to one.

5. LAYOUT OF MESSAGES

5.1 Standard Data Items

The standardised Data Items which shall be used for the transmission of SDPS service messages are described in the following pages.

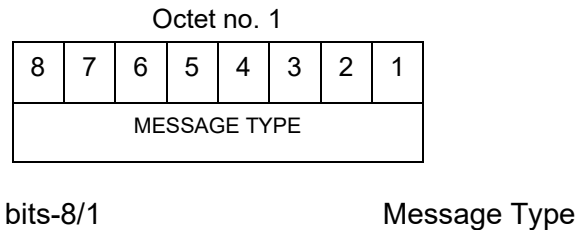
5.2 Description of Standard Data Items

5.2.1 Data Item I065/000, Message Type

Definition: This Data Item allows for a more convenient handling of the messages at the receiver side by further defining the type of transaction.

Format: One-octet fixed length Data Item.

Structure:



Encoding rule :

This data item shall be present in every ASTERIX record.

NOTES

1. In application where transactions of various types are exchanged, the Message Type Data Item facilitates the proper message handling at the receiver side.
2. The following set of Message Types are standardised for category 065 records:
 - 001 SDPS Status,
 - 002 End of Batch,
 - 003 Service Status Report.

The list of items present for the three message types is defined in the following table. M stands for mandatory, O for optional, X for never present.

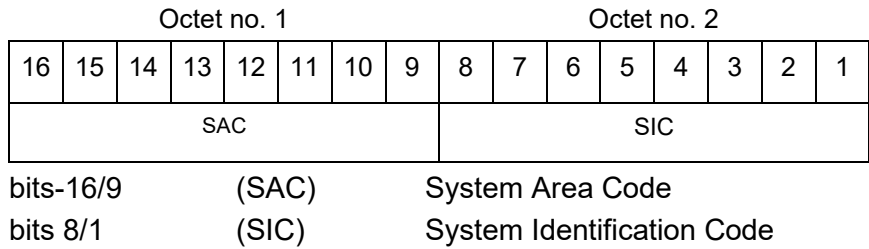
Item	Type	001 SDPS Status	002 End of Batch	003 Service Status Report
I065/000	Message Type	M	M	M
I065/010	Data Source Identifier	M	M	M
I065/015	Service Identification	M	M	M
I065/020	Batch Number	X	M	X
I065/030	Time of Message	M	M	M
I065/040	SDPS configuration and status	M	X	X
I065/050	Service Status Report	X	X	M

5.2.2 Data Item I065/010, Data Source Identifier

Definition : Identification of the SDPS sending the data

Format : Two-octet fixed length Data Item

Structure:



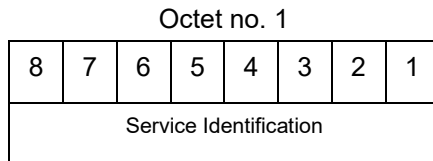
NOTE - The up-to-date list of SACs is published on the EUROCONTROL Web Site (<http://www.eurocontrol.int/asterix>).

5.2.3 Data Item I065/015, Service Identification

Definition : Identification of the service provided to one or more users.

Format : One-Octet fixed length data item.

Structure:



Bits-8/1 Service Identification

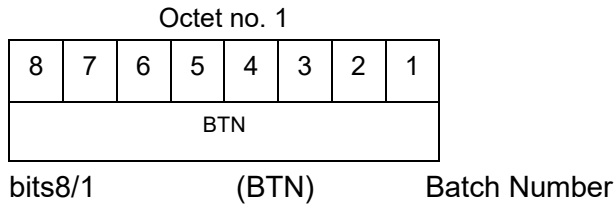
NOTE - the service identification is allocated by the SDPS

5.2.4 Data Item I065/020, Batch Number

Definition : A number indicating the completion of a service for that batch of track data, from 0 to N-1, N being the number of batches used to make one complete processing cycle.

Format : One-Octet fixed length data item.

Structure:

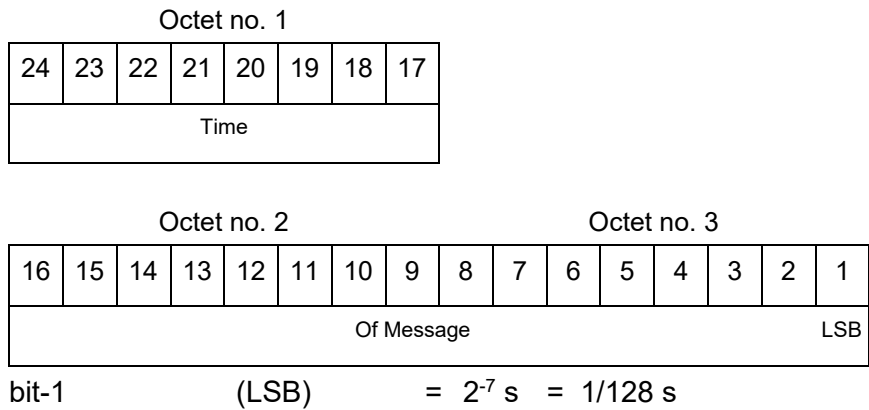


5.2.5 Data Item I065/030, Time of Message

Definition : Absolute time stamping of the message, in the form of elapsed time since last midnight, expressed as UTC.

Format : Three-Octet fixed length data item.

Structure:



NOTE - The time of the day value is reset to zero at every midnight.

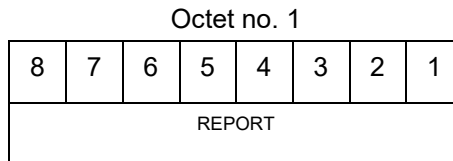
5.2.6 Data Item I065/040, SDPS Configuration and Status**Definition :** Status of an SDPS.**Format :** One-Octet fixed length data item.**Structure:**

Octet no. 1

8	7	6	5	4	3	2	1
NOGO		OVL	TSV	PSS		STTN	0

Bits 8/7	(NOGO)	= 00	operational
		= 01	degraded
		= 10	not currently connected
		= 11	unknown
bit 6	(OVL)	= 0	Default
		= 1	Overload
bit 5	(TSV)	= 0	Default
		= 1	Invalid Time Source
bit 4/3	(PSS)	Processing System Status	
		= 00	not applicable
		= 01	SDPS-1 selected
		= 10	SDPS-2 selected
		= 11	SDPS-3 selected
bit 2	(STTN)	Track re-numbering indication (see note below)	
bit 1	spare bit set to zero		

NOTE: Bit 2, the STTN bit indicates when track numbering has been restarted. The STTN bit is a toggle bit that changes its value whenever the SDPS system starts re-numbering its tracks. Re-numbering of the track takes place either after SDPS start-up (cold or hot start-up) or when a configuration set has been changed (please note that the latter case is ARTAS specific behaviour and may be different in another SDPS).

5.2.7 Data Item I065/050, Service Status Report**Definition :** Report sent by the SDPS related to a service**Format :** One-Octet fixed length data item.**Structure:**

bits 8/1

- (REPORT)=
- 1: service degradation
 - 2: service degradation ended
 - 3: main radar out of service
 - 4: service interrupted by the operator
 - 5: service interrupted due to contingency
 - 6: ready for service restart after contingency
 - 7: service ended by the operator
 - 8: failure of user main radar
 - 9: service restarted by the operator
 - 10: main radar becoming operational
 - 11: main radar becoming degraded
 - 12: service continuity interrupted due to disconnection with adjacent unit
 - 13: service continuity restarted
 - 14: service synchronised on backup radar
 - 15: service synchronised on main radar
 - 16: main and backup radar, if any, failed

5.3 User Application Profile for Category 065

The following User Application Profile shall be used for the transmission of SDPS service messages.

Table 1 – SDPS Service Messages UAP

FRN	Data Item	Information	Length
1	I065/010	Data Source Identifier	2
2	I065/000	Message Type	1
3	I065/015	Service Identification	1
4	I065/030	Time of Message	3
5	I065/020	Batch Number	1
6	I065/040	SDPS Configuration and Status	1
7	I065/050	Service Status Report	1
FX	-	Field extension indicator	-
8	-	Spare	-
9	-	Spare	-
10	-	Spare	-
11	-	Spare	-
12	-	Spare	-
13	RE	Reserved Expansion Field	1+1+
14	SP	Special Purpose Field	1+1+
FX	-	Field extension indicator	-

In the above table

- the first column indicates the Field Reference Number (FRN) associated to each Data Item used in the UAP;
- the fourth column gives the format and the length of each item, a stand-alone figure indicates the octet-count of a fixed-length Data Item, 1+ indicates a variable-length Data Item comprising a first part of 1 octet followed by n-octets extents as necessary.

Although in Edition 1.1 of the Specification for the Reserved Expansion Field of Category 065 Data Item I065/REF/ARL was introduced to permit the extension of the UAP, the AMG in it's 18th meeting decided to not apply this concept to prevent potential interoperability issue between systems not updated to the latest Edition of the Category 065 specification or the corresponding REF. As such, I065/REF/ARL **shall** not be used. However, for reasons of backwards compatibility the Data Item will be kept in the Specification. Also, since the Data Item has been declared as mandatory, also the use the Reserved Expansion Field is mandatory for systems that support the REF following Edition 1.1 or higher. Implementation of the REF Edition 1.1 or higher needs to be carefully coordinated between all Users.



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