ETSI EN 303 213-7 V2.1.1 (2020-06)

EUROPEAN STANDARD

Advanced Surface Movement Guidance and Control System (A-SMGCS); Part 7: Community Specification for A-SMGCS routing service

Reference

DEN/ERM-TGAERO-37-7

Keywords

aeronautical, air traffic management, interoperability

ETSI

650 Route des Lucioles
F-06921 Sophia Antipolis Cedex - FRANCE

Tel.: +33 4 92 94 42 00 Fax: +33 4 93 65 47 16

Siret N° 348 623 562 00017 - NAF 742 C
Association à but non lucratif enregistrée à la
Sous-Préfecture de Grasse (06) N° 7803/88

Important notice

The present document can be downloaded from:
http://www.etsi.org/standards-search

The present document may be made available in electronic versions and/or in print. The content of any electronic and/or print versions of the present document shall not be modified without the prior written authorization of ETSI. In case of any existing or perceived difference in contents between such versions and/or in print, the prevailing version of an ETSI deliverable is the one made publicly available in PDF format at www.etsi.org/deliver.

Users of the present document should be aware that the document may be subject to revision or change of status. Information on the current status of this and other ETSI documents is available at
https://portal.etsi.org/TB/ETSIDeliverableStatus.aspx

If you find errors in the present document, please send your comment to one of the following services:
https://portal.etsi.org/People/CommiteeSupportStaff.aspx

Contents

Intellectual Property Rights

Essential patents

IPRs essential or potentially essential to normative deliverables may have been declared to ETSI. The information pertaining to these essential IPRs, if any, is publicly available for **ETSI members and non-members**, and can be found in ETSI SR 000 314: *"Intellectual Property Rights (IPRs); Essential, or potentially Essential, IPRs notified to ETSI in respect of ETSI standards"*, which is available from the ETSI Secretariat. Latest updates are available on the ETSI Web server (https://ipr.etsi.org/).

Pursuant to the ETSI IPR Policy, no investigation, including IPR searches, has been carried out by ETSI. No guarantee can be given as to the existence of other IPRs not referenced in ETSI SR 000 314 (or the updates on the ETSI Web server) which are, or may be, or may become, essential to the present document.

Trademarks

The present document may include trademarks and/or tradenames which are asserted and/or registered by their owners. ETSI claims no ownership of these except for any which are indicated as being the property of ETSI, and conveys no right to use or reproduce any trademark and/or tradename. Mention of those trademarks in the present document does not constitute an endorsement by ETSI of products, services or organizations associated with those trademarks.

Foreword

This European Standard (EN) has been produced by ETSI Technical Committee Electromagnetic compatibility and Radio spectrum Matters (ERM).

The presumption of conformity which is linked to the full application of ETSI EN 303 213 (parts 1 to 4, 7 and 8) can only be claimed after ETSI EN 303 213 (parts 1 to 4, 7 and 8) have been listed in the Official Journal of the European Union as Community Specifications.

General requirements for presumption of conformity to Regulation (EU) No 2018/1139 [i.4] are given in the normative annex of the present document.

NOTE: Other requirements and other EU Regulations and/or Directives may be applicable to the product(s) falling within the scope of the present document.

The present document is part 7 of a multi-part deliverable covering Advanced Surface Movement Guidance and Control System (A-SMGCS), as identified below:

Part 1: "Community Specification for A-SMGCS surveillance service including external interfaces";

Part 2: "Community Specification for A-SMGCS airport safety support service";

Part 3: "Community Specification for a deployed cooperative sensor including its interfaces";

Part 4: "Community Specification for a deployed non-cooperative sensor including its interfaces";

Part 5: "Harmonised Standard for access to radio spectrum for Multilateration (MLAT) equipment";

Part 6: "Harmonised Standard for access to radio spectrum for deployed surface movement radar sensors";

Part 7: "Community Specification for A-SMGCS routing service";

Part 8: "Community Specification for A-SMGCS guidance service".

National transposition dates	
Date of adoption of this EN:	11 June 2020
Date of latest announcement of this EN (doa):	30 September 2020
Date of latest publication of new National Standard or endorsement of this EN (dop/e):	31 March 2021
Date of withdrawal of any conflicting National Standard (dow):	31 March 2021

Modal verbs terminology

In the present document "**shall**", "**shall not**", "**should**", "**should not**", "**may**", "**need not**", "**will**", "**will not**", "**can**" and "**cannot**" are to be interpreted as described in clause 3.2 of the ETSI Drafting Rules (Verbal forms for the expression of provisions).

"**must**" and "**must not**" are **NOT** allowed in ETSI deliverables except when used in direct citation.

1 Scope

The present document is applicable to the Advanced Surface Movement Guidance and Control System (A-SMGCS) Routing Service. This service is based on the A-SMGCS surveillance service as specified in ETSI EN 303 213-1 [3] and generates individual routes for mobiles based on the trajectory start and end points and known constraints (e.g. standard taxi routes, taxiway closures). In most cases these trajectory points for aircraft are the assigned runway holding point and parking stand, or for vehicles, two positions on the movement area. Routes can be created or modified by the Controller at any time.

The present document provides a European Standard for manufacturers, Air Navigation Service Providers and/or Airport Operators, who have to demonstrate and declare compliance of their systems and constituents to the Essential Requirements (ERs) of Annex VIII of Regulation (EU) No 2018/1139 [i.4].

NOTE 1: The ERs in Annex VIII of Regulation (EU) No 2018/1139 [i.4] covered by the present document are outlined in Table A.1.

NOTE 2: Although the ERs of the SES Interoperability Regulation [i.1] have been repealed with effect from 11 September 2018 [i.4], a mapping of the requirements for the A-SMGCS Surveillance Service to this same regulation [i.1] is provided in Annex B.

Any software elements related to the software assurance level of an A-SMGCS are outside of the scope of the present document. As such the ERs of Regulation (EU) No 2018/1139 [i.4] are not considered for software elements within the present document.

The present document does not give presumption of conformity related to the maintenance requirements, environmental constraints, procedure level, effect of harmful interference and civil/military coordination.

NOTE 3: For these ERs, the Air Navigation Service Provider will need to provide supplementary compliance within their Interoperability Technical Files.

The present document does not give presumption of conformity to any current interoperability Implementing Rules (IRs).

NOTE 4: Currently there are no relevant Implementing Rules for A-SMGCS.

Requirements in the present document which refer to "should" statements or recommendations in the normatively referenced material (clause 2.1) are to be interpreted as fully normative ("shall") for the purpose of compliance with the present document if they are unambiguously referred to from the present document.

The reference to particular requirements is done either by citing the unambiguous requirement number or range of numbers (e.g. "[REQ 30.] to [REQ 35.]") or, if no requirement numbers are available, by indicating the paragraph and clause of the reference material where the requirement can be found.

NOTE 5: Other requirements and other EU Regulations and/or Directives may be applicable to the product(s) falling within the scope of the present document.

2 References

2.1 Normative references

References are either specific (identified by date of publication and/or edition number or version number) or non-specific. For specific references, only the cited version applies. For non-specific references, the latest version of the referenced document (including any amendments) applies.

Referenced documents which are not found to be publicly available in the expected location might be found at https://docbox.etsi.org/Reference/.

NOTE: While any hyperlinks included in this clause were valid at the time of publication, ETSI cannot guarantee their long term validity.

The following referenced documents are necessary for the application of the present document.

[1] EUROCAE ED-87D (June 2019): "Minimum Aviation System Performance Standard for Advanced Surface Movement Guidance and Control Systems (A-SMGCS)".

[2] EUROCONTROL-SPEC-171 (Edition 1.0, 01/03/2018): "EUROCONTROL Specification for Advanced-Surface Movement Guidance and Control System (A-SMGCS) Services".

[3] ETSI EN 303 213-1: "Advanced Surface Movement Guidance and Control System (A-SMGCS); Part 1: Community Specification for A-SMGCS surveillance service including external interfaces".

2.2 Informative references

References are either specific (identified by date of publication and/or edition number or version number) or non-specific. For specific references, only the cited version applies. For non-specific references, the latest version of the referenced document (including any amendments) applies.

NOTE: While any hyperlinks included in this clause were valid at the time of publication, ETSI cannot guarantee their long term validity.

The following referenced documents are not necessary for the application of the present document but they assist the user with regard to a particular subject area.

[i.1] Regulation (EC) No 552/2004 of the European Parliament and of the Council of 10 March 2004 on the interoperability of the European Air Traffic Management network (interoperability Regulation), OJ L 96, 31.03.2004, p. 26 as amended by Regulation (EC) No 1070/2009, OJ L 300, 14.11.2009, p. 34.

[i.2] ICAO Document 9830, AN/452: "Advanced Surface Movement Guidance and Control Systems (A-SMGCS) Manual", First Edition, 2004.

[i.3] Regulation (EC) No 1070/2009 of the European Parliament and of the Council of 21 October 2009 amending Regulations (EC) No 549/2004, (EC) No 550/2004, (EC) No 551/2004 and (EC) No 552/2004 in order to improve the performance and sustainability of the European aviation system, OJ L 300, 14.11.2009.

[i.4] Regulation (EU) No 2018/1139 of the European Parliament and of the Council of 4 July 2018 on common rules in the field of civil aviation and establishing a European Union Aviation Safety Agency, and amending Regulations (EC) No 2111/2005, (EC) No 1008/2008, (EU) No 996/2010, (EU) No 376/2014 and Directives 2014/30/EU and 2014/53/EU of the European Parliament and of the Council, and repealing Regulations (EC) No 552/2004 and (EC) No 216/2008 of the European Parliament and of the Council and Council Regulation (EEC) No 3922/91.

3 Definition of terms, symbols and abbreviations

3.1 Terms

For the purposes of the present document, the terms given in EUROCAE ED-87D [1] and the following apply:

Advanced Surface Movement Guidance and Control System (A-SMGCS): system providing as a minimum Surveillance and which can include Airport Safety Support, Routing and Guidance to aircraft and vehicles in order to maintain the airport throughput under all local weather conditions whilst maintaining the required level of safety

NOTE: This definition is derived from EUROCAE ED-87D [1].

aerodrome: defined area (including any buildings, installations, and equipment) intended to be used either wholly or in part for arrival, departure and surface movement of aircraft

NOTE: This definition is derived from the ICAO Document 9830 [i.2].

apron: defined area on an aerodrome, intended to accommodate aircraft for purposes of loading or unloading passengers, mail or cargo, fuelling, parking or maintenance

NOTE 1: This definition is derived from the ICAO Document 9830 [i.2].

NOTE 2: De-icing platforms, including remote de-icing areas, are considered as apron areas.

availability: probability that the system will operate satisfactorily at a given point in time when used under stated conditions in an ideal support environment

NOTE: This definition is derived from EUROCAE ED-87D [1].

constituents: tangible objects such as hardware and intangible objects such as software upon which the interoperability of the EATMN depends

manoeuvring area: part of an aerodrome to be used for take-off, landing and taxiing of aircraft, excluding aprons

NOTE: This definition is derived from the ICAO Document 9830 [i.2].

movement area: part of an aerodrome to be used for take-off, landing and taxiing of aircraft, consisting of the manoeuvring area and aprons

NOTE: This definition is derived from the ICAO Document 9830 [i.2].

procedure: standard method for either the technical or operational use of the system, in the context of agreed and validated concepts of operation requiring uniform implementation throughout the EATMN

system: aggregation of airborne and ground based constituents, as well as space-based equipment, that provides support for air navigation services for all phases of flight

3.2 Symbols

Void.

3.3 Abbreviations

For the purposes of the present document, the following abbreviations apply:

A-CDM	Airport Collaborative Decision Making
A-SMGCS	Advanced Surface Movement Guidance and Control System
ATM	Air Traffic Management
ATS	Air Traffic Service
EATMN	European Air Traffic Management Network
EN	European Norm
ER	Essential Requirement
EU	European Union
EUROCAE	EUROpean organization for Civil Aviation Equipment
EUROCONTROL	EUROpean organization for the safety of air navigation
HMI	Human Machine Interface
ICAO	International Civil Aviation Organization
IPR	Intellectual Property Rights
SES	Single European Sky
TMA	Terminal Manoeuvring Area

4 Requirements for the A-SMGCS Routing Service

4.0 General

The A-SMGCS routing service is based on the A-SMGCS surveillance service as defined in ETSI EN 303 213-1 [3].

Both the surveillance and routing services are constituents of the A-SMGCS. Hence requirements on the system level related to system safety, reliability, system security and documentation are already specified in ETSI EN 303 213-1 [3] and will not be duplicated in the present document.

4.1 Dependency on the A-SMGCS surveillance service

The A-SMGCS surveillance service shall comply with the requirements as defined in ETSI EN 303 213-1 [3].

4.2 Routing Service Basic Functionality

4.2.0 General requirements

The routing service shall comply with the requirements as defined in ED-87D [1], chapters 2.1.4 and 3.5, requirements [REQ 7.], [REQ 8.], [REQ 9.], [REQ 23.], [REQ 24.], [REQ 25.].

In addition, the routing service shall comply with the requirements as defined in the EUROCONTROL Specification for A-SMGCS Services [2], chapter 6.4.1, requirements ASMGCS-[ROUT]-[010], ASMGCS-[ROUT]-[020], ASMGCS-[ROUT]-[030], ASMGCS-[ROUT]-[040], ASMGCS-[ROUT]-[050], ASMGCS-[ROUT]-[066], ASMGCS-[ROUT]-[070], ASMGCS-[ROUT]-[080], ASMGCS-[ROUT]-[090], ASMGCS-[ROUT]-[100], ASMGCS-[ROUT]-[110].

4.2.1 Generation of routes without controller interaction

Generation of routes without controller interaction shall comply with the requirements as defined in ED-87D [1], chapters 2.1.4 and 2.2.1, requirements [REQ 7.], [REQ 8.], [REQ 9.].

In addition, the generation of routes without controller interaction shall comply with the requirements as defined in the EUROCONTROL Specification for A-SMGCS Services [2], chapter 6.4.2, requirements ASMGCS-[ROUT]-[120], ASMGCS-[ROUT]-[130], ASMGCS-[ROUT]-[140], ASMGCS-[ROUT]-[150], ASMGCS-[ROUT]-[160], ASMGCS-[ROUT]-[170], ASMGCS-[ROUT]-[180], ASMGCS-[ROUT]-[190], ASMGCS-[ROUT]-[200], ASMGCS-[ROUT]-[210], ASMGCS-[ROUT]-[220], ASMGCS-[ROUT]-[230], ASMGCS-[ROUT]-[240].

4.3 Controller Interaction with the Routing Service

Controller interaction with the routing service shall comply with the requirements as defined in ED-87D [1], chapters 2.1.4 and 3.6, [REQ 7.], [REQ 8.], [REQ 9.], [REQ 26.].

In addition, the controller interaction with the routing service shall comply with the requirements as defined in the EUROCONTROL Specification for A-SMGCS Services [2], chapter 6.4.3, requirements ASMGCS-[ROUT]-[250], ASMGCS-[ROUT]-[260], ASMGCS-[ROUT]-[270], ASMGCS-[ROUT]-[280], ASMGCS-[ROUT]-[290], ASMGCS-[ROUT]-[300], ASMGCS-[ROUT]-[310], ASMGCS-[ROUT]-[320].

4.4 Provision of Taxi Times to Airport-CDM

Provision of taxi times to Airport-CDM shall comply with the requirements as defined in ED-87D [1], chapters 2.1.4.1, 3.5.5 and 3.5.6, requirements [REQ 7.], [REQ 8.], [REQ 9.], [REQ 25.], as well as to the requirements defined in the EUROCONTROL Specification for A-SMGCS Services [2], chapter 6.4.4, requirements ASMGCS-[ROUT]-[330], ASMGCS-[ROUT]-[340], ASMGCS-[ROUT]-[350], ASMGCS-[ROUT]-[360].

4.5 Design Requirements for the A-SMGCS Routing Service

4.5.1 Design Requirements on System Level

The design requirements for the A-SMGCS routing service regarding Modularity, System Integrity and Safety shall be identical to the design requirements for the A-SMGCS surveillance service as defined in ETSI EN 303 213-1 [3].

4.5.2 Performance and Capacity Parameters

The routing service performance and capacity parameters shall comply with the requirements as defined in ED-87D [1], chapter 3.5, requirements [REQ 23.], [REQ 24.], [REQ 25.].

4.5.3 Evolution

The evolution shall comply with the requirements as defined in ED-87D [1], chapter 1.8.3.

4.5.4 HMI and Human capabilities

The A-SMGCS Routing Service HMI shall be designed in such a way, that the human capabilities shall be compatible with the principals described in ED-87D [1], chapter 2.2.1 as well as to the requirements defined in the EUROCONTROL Specification for A-SMGCS Services [2], chapters 5.3.1 and 6.1, requirements ASMGCS-[GENL]-[070], ASMGCS-[GENL]-[100], ASMGCS-[GENL]-[110], ASMGCS-[GENL]-[120], ASMGCS-[GENL]-[130], ASMGCS-[GENL]-[140], ASMGCS-[GENL]-[150].

5 Testing

5.1 Acceptance testing requirements for the A-SMGCS Routing Service

5.1.1 Acceptance testing requirements on System Level

All system level tests shall be performed identical to the requirements as defined for the A-SMGCS surveillance service, as defined in ETSI EN 303 213-1 [3], clause 5, requirements [REQ 33.], [REQ 34.] and [REQ 35.].

5.1.2 Acceptance testing requirements specific to the routing service

The routing service shall perform the build tests as defined in ED-87D [1], chapters 5.1 and 5.5 as well as requirements [REQ 33.], [REQ 34.] and [REQ 35.].