Draft ETSI EN 303 213-1 V2.0.1 (2020-03)

Advanced Surface Movement Guidance and Control System (A-SMGCS); Part 1: Community Specification for A-SMGCS surveillance service including external interfaces

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Reference

REN/ERM-TGAERO-37-1

Keywords

aeronautical, air traffic management, interoperability

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Foreword

This draft European Standard (EN) has been produced by ETSI Technical Committee Electromagnetic compatibility and Radio spectrum Matters (ERM), and is now submitted for the combined Public Enquiry and Vote phase of the ETSI standards EN Approval Procedure.

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.10] are given in the normative annexes 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 1 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".

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Proposed national transposition dates	
Date of latest announcement of this EN (doa):	3 months after ETSI publication
Date of latest publication of new National Standard or endorsement of this EN (dop/e):	6 months after doa
Date of withdrawal of any conflicting National Standard (dow):	6 months after doa

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).

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1 Scope

The present document is applicable to the Advanced Surface Movement Guidance and Control System (A-SMGCS) Surveillance Service. This system provides enhanced surveillance functionalities, as well as a display to controllers with accurate and unambiguous identity and position information for mobiles on the entire manoeuvring and movement area.

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 2018/1139 [i.10].

NOTE 1: The ERs in Annex VIII of Regulation EU 2018/1139 [i.10] 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.10], 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 out of scope of the present document. As such the ERs of Regulation EU 2018/1139 [i.10] 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.

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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".

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.

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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 (the 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] ETSI EN 303 213-3: "Advanced Surface Movement Guidance and Control System (A-SMGCS); Part 3: Community Specification for a deployed cooperative sensor including its interfaces".

[i.3] ETSI EN 303 213-4-1: "Advanced Surface Movement Guidance and Control System (A-SMGCS); Part 4: Community Specification for application under the Single European Sky Interoperability Regulation EC 552/2004 for a deployed non-cooperative sensor including its interfaces; Sub-part 1: Generic requirements for non-cooperative sensor".

[i.4] ETSI EN 303 213-4-2: "Advanced Surface Movement Guidance and Control System (A-SMGCS); Part 4: Community Specification for application under the Single European Sky Interoperability Regulation EC 552/2004 for a deployed non-cooperative sensor including its interfaces; Sub-part 2: Specific requirements for a deployed Surface Movement Radar sensor".

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[i.5] Regulation (EC) No 549/2004 of the European Parliament and of the Council of 10 March 2004 laying down the framework for the creation of the single European sky (the framework Regulation), OJ L 96, 31.03.2004, p. 1 as amended by Regulation (EC) No 1070/2009, OJ L 300, 14.11.2009, p. 34.

[i.6] EUROCAE ED-128 (10/2007): "Guidelines for surveillance data fusion in advanced surface movement guidance and control systems (A-SMGCS) levels 1 and 2".

[i.7] ICAO Document 9830, AN/452: "Advanced Surface Movement Guidance and Control Systems (A-SMGCS) Manual", First Edition, 2004.

[i.8] EUROCONTROL 10/07/15-71 (V2.1: 30/06/2010): "A-SMGCS Levels 1 & 2 Preliminary Safety Case".

[i.9] 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.10] 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, OJ L 212, 22.08.2018.

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: 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.7].

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.7].

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.7].

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.7].

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

target: aircraft, vehicle or other obstacle, whose image is displayed on a surveillance display

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

test targets: form of either fixed reflectors or active devices transponders, mounted at fixed positions within the Coverage Volume

update: renewal of Target Reports relating to all Targets under Surveillance

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

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3.2 Symbols

Void.

3.3 Abbreviations

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

A-SMGCS	Advanced Surface Movement Guidance and Control Systems
AERO	Technical Committee Aeronautics
ATM	Air Traffic Management
ATS	Air Traffic Service
AVOL	Aerodrome Visibility Operational Level
CS	Community Specification
DFP	Data Fusion Processor
EATMN	European Air Traffic Management Network
EC	European Communities
EN	European Norm - (standard)
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
MASPS	Minimum Aviation Systems Performance Specification
MLAT	MultiLATeration
PRA	Position Registration Accuracy
SARPS	Standards and Recommended Practices
SES	Single European Sky
SESAR	Single European Sky Area Responsibility
SMR	Surface Movement Radar
TMA	Terminal Manoeuvring Area

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4 Requirements for the A-SMGCS Surveillance Service

4.1 Requirements for A-SMGCS Surveillance Service Constituents

4.1.1 General guidance on A-SMGCS Surveillance Service Constituents

Data Fusion and HMI are considered as part of the System but are not at this time defined as constituents. However, Data Fusion and HMI are currently defined at System level and they have been included here, since they may become constituents in the future.

Guidance for the Data Fusion can be found in ED-128 [i.6].

The Data fusion could be part of a larger data fusion processor providing other ATS functions.

The Data fusion may be a separate part of the CS in the future.

4.1.2 Constituent types for the A-SMGCS Surveillance Service

The A-SMGCS Surveillance Service shall consist of the following constituents as a minimum for the implementation, operation and maintenance:

1) Non-Cooperative Surveillance Sensor (e.g. Surface Movement Radar).

2) Cooperative Surveillance Sensor (Multilateration System).

4.1.3 Constituent - Surface Movement Radar (SMR)

The SMR constituent of an A-SMGCS is covered in ETSI EN 303 213-4-1 [i.3] (Generic requirements) and ETSI EN 303 213-4-2 [i.4] (Specific requirements).

4.1.4 Interfaces for SMR

The interfaces for SMR constituents shall comply with the requirements as defined in ED-87D [1], chapter 2.1.2.3.

4.1.5 Constituent - Multilateration

The multilateration constituent of an A-SMGCS is covered in ETSI EN 303 213-3 [i.2] (cooperative sensors).

4.1.6 Interfaces for Multilateration

The interfaces for multilateration constituents shall comply with the requirements as defined in ED-87D [1], chapter 2.1.2.3.

4.1.7 Interface for Data fusion

The interfaces for the data fusion in an A-SMGCS shall comply with the requirements as defined in ED-87D [1], chapter 2.1.2.4.

NOTE: Guidance for the Data Fusion can be found in ED-128 [i.6].

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4.1.8 Human Machine Interface (HMI)

The requirements for the HMI are further described in clause 4.2.5 and clause 5.1.1.4 of the present document.

NOTE 1: The HMI could be part of a larger HMI, providing other ATS functions.

NOTE 2: The HMI could be a separate part of the CS in the future.

4.1.9 Interface for HMI

The interface for the HMI shall be capable to exchange data with the data fusion processor.

4.2 Design Requirements for the A-SMGCS Surveillance Service

4.2.1 Design Requirements on System Level

4.2.1.1 Modularity

The System shall comply with the design requirements as defined in ED-87D [1], chapter 1.8.

4.2.1.2 System Integrity

The System integrity shall comply with the design requirements as defined in ED-87D [1], chapter 3.7.2, requirements [REQ 27.], [REQ 28.], [REQ 29.].

4.2.1.3 Availability and Continuity of Service

The availability and continuity of service for A-SMGCS shall comply with the requirements as defined in ED-87D [1], chapters 3.7.3, 3.7.4 and 3.7.5, requirements [REQ 30.], [REQ 31.], [REQ 32.] and in the EUROCONTROL Specification for A-SMGCS Services [2], requirements ASMGCS-[GENL]-[170], ASMGCS-[GENL]-[180], ASMGCS-[GENL]-[190] and ASMGCS-[GENL]-[200].

4.2.1.4 Identification

The functional requirement for identification shall comply with the requirements as defined in ED-87D [1], chapter 3.3.7, Table 3-1 and requirements [REQ 19.] and [REQ 20.].

4.2.1.5 Position Registration Accuracy

The functional requirement for position registration accuracy shall comply with the requirements as defined in ED-87D [1], chapter 3.3.8, Table 3-1 and requirements [REQ 19.] and [REQ 20.].

4.2.1.6 Logical architecture

The logical architecture of the system shall comply with the requirements as defined in ED-87D [1], chapter 1.8.

4.2.1.7 Safety

4.2.1.7.1 Failure effect

The A-SMGCS Surveillance Service shall be designed in such a way, that erroneous data from any constituent would have an acceptable impact on safety.

NOTE: This requirement is derived from the EUROCONTROL Specification for A-SMGCS Services [2], requirement ASMGCS-[GENL]-[180].

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4.2.1.7.2 Reliability

The reliability of the system shall comply with the requirements as defined in the EUROCONTROL Specification for A-SMGCS Services [2], requirements ASMGCS-[GENL]-[170], ASMGCS-[GENL]-[180], ASMGCS-[GENL]-[190], ASMGCS-[GENL]-[200], and ED-87D [1], chapters 3.7.3, 3.7.4 and 3.7.5, requirements [REQ 31.], [REQ 31.], [REQ 32.].

4.2.1.7.3 Human capabilities

The A-SMGCS Surveillance Service shall be designed in such a way, that the human capabilities shall be compatible with the principals described in ED-87D [1], chapter 3.6, requirement [REQ 26.].

4.2.1.7.4 Safety Assessment

A safety assessment for an A-SMGCS Surveillance Service shall be provided and updated after modifications to the service. The safety objectives shall comply with the requirements as defined in ED-87D [1], chapter 1.8.6.

NOTE: The safety assessment may follow the methodology from A-SMGCS Levels 1&2 Preliminary Safety Case [i.8].

4.2.1.8 Capacity and Quality

4.2.1.8.1 Handle Traffic Movements

The handling of traffic movements shall comply with the requirements as defined in the EUROCONTROL Specification for A-SMGCS Services [2], chapters 3.2, 6.1 and 6.2.