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**Advanced Surface Movement Guidance
and Control System (A-SMGCS);
Part 2: Community Specification for application under the
Single European Sky Interoperability Regulation EC 552/2004
for A-SMGCS Level 2 including external interfaces**

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Foreword

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

The present document has been produced by ETSI in response to European Commission mandate M/390 for the Interoperability of the European Air Traffic Management Network.

The present document has been developed in cooperation with EUROCAE to support Essential Requirements of the Single European Sky Interoperability Regulation 552/2004 [i.1] and/or requirements given in implementing rules for interoperability based on the Single European Interoperability Regulation.

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

General and specific requirements for presumption of conformity to SES Interoperability Regulation 552/2004 [i.1] as amended by Regulation 1070/2009 [i.5] 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 2 of a multi-part deliverable covering Advanced Surface Movement Guidance and Control System (A-SMGCS), as identified below:

- Part 1: "Community Specification for application under the Single European Sky Interoperability Regulation EC 552/2004 for A-SMGCS Level 1 including external interfaces";
- Part 2: "Community Specification for application under the Single European Sky Interoperability Regulation EC 552/2004 for A-SMGCS Level 2 including external interfaces";**
- Part 3: "Community Specification for application under the Single European Sky Interoperability Regulation EC 552/2004 for a deployed cooperative sensor including its interfaces";
- 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";
- Part 5: "Harmonised Standard covering the essential requirements of article 3.2 of the Directive 2014/53/EU for multilateration equipment";
- Part 6: "Harmonised Standard covering the essential requirements of article 3.2 of the Directive 2014/53/EU for deployed surface movement radar sensors".

National transposition dates	
Date of adoption of this EN:	28 November 2016
Date of latest announcement of this EN (doa):	28 February 2017
Date of latest publication of new National Standard or endorsement of this EN (dop/e):	31 August 2017
Date of withdrawal of any conflicting National Standard (dow):	31 August 2017

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.

Introduction

The European Union launched the Legislation "Single European Sky" (SES) in 2002 which was adopted in 2004 and amended by Regulation (EC) No 1070/2009 [i.5].

The SES legislation is based on a framework of 4 regulations, which includes the Interoperability Regulation [i.1]. The objective of the Interoperability Regulation is to ensure interoperability of the European Air Traffic Management Network (EATMN) consistent with air navigation services. Under this regulation, the use of a European Standard referenced in the Official Journal of the European Union as Community Specification (CS) is a means of compliance to the essential requirements of the Regulation and/or the relevant implementing rules for interoperability.

The present document takes into account the Council Decision 2009/320/EC endorsing the European Air Traffic Management Master Plan of the Single European Sky ATM Research (SESAR) project [i.3].

The present document takes in to account the updated referenced documents from EUROCAE and EUROCONTROL.

1 Scope

The present document is applicable to Advanced Surface Movement Guidance and Control Systems (A-SMGCS) Level 2. This system provides enhanced surveillance functionalities such as advanced monitoring and alerting functions.

The present document provides a European Standard for Air Navigation Service Providers, who need to demonstrate and declare compliance of their systems and procedures to the IOP Regulation.

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 essential requirements of the Interoperability Regulation 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 1: For these ERs, please refer to the Air Navigation Service Provider procedures.

NOTE 2: For those parts of the essential requirements, where annexes A and SA give no presumption of conformity, please refer to the Air Navigation Service Provider procedures.

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.

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-87C (January 2015): "MASPS for Advanced Surface Movement Guidance and Control Systems (A-SMGCS) - Levels 1 and 2".
- [2] EUROCONTROL 10/07/15-69 (V2.1: 30/06/2010): "Operational Concept and Requirements for A-SMGCS Implementation Level 2".
- [3] EUROCONTROL 10/07/15-71 (V2.1: 30/06/2010): "Preliminary Safety Case A-SMGCS Levels 1 and 2".
- [4] EUROCONTROL 10/07/15-67 (V2.1: 30/06/2010): "Functional Requirements for A-SMGCS Implementation Level 2".
- [5] ETSI EN 303 213-1 (V1.3.1): "Advanced Surface Movement Guidance and Control System (A-SMGCS); Part 1: Community Specification for application under the Single European Sky Interoperability Regulation EC 552/2004 for A-SMGCS Level 1 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 as amended by Regulation (EC) No 1070/2009.
- [i.2] 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 as amended by Regulation (EC) No 1070/2009.
- [i.3] Council Decision 2009/320/EC endorsing the European Air Traffic Management Master Plan of the Single European Sky ATM Research (SESAR) project, 30.03.2009.
- [i.4] ICAO Document 9830, AN/452: "Advanced Surface Movement Guidance and Control Systems (A-SMGCS) Manual", First Edition, 2004.
- [i.5] 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.6] ETSI EN 303 213-3: "Advanced Surface Movement Guidance and Control System (A-SMGCS); Part 3: Community Specification for application under the Single European Sky Interoperability Regulation EC 552/2004 for a deployed cooperative sensor including its interfaces".
- [i.7] ETSI EN 303 213-4: "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".
- [i.8] Directive 98/34/EC of the European Parliament and of the Council of 22 June 1998 laying down a procedure for the provision of information in the field of technical standards and regulations.

3 Definitions and abbreviations

3.1 Definitions

For the purposes of the present document, the following terms and definitions apply:

alert situation: any situation relating to aerodrome operations which has been defined as requiring particular attention or action

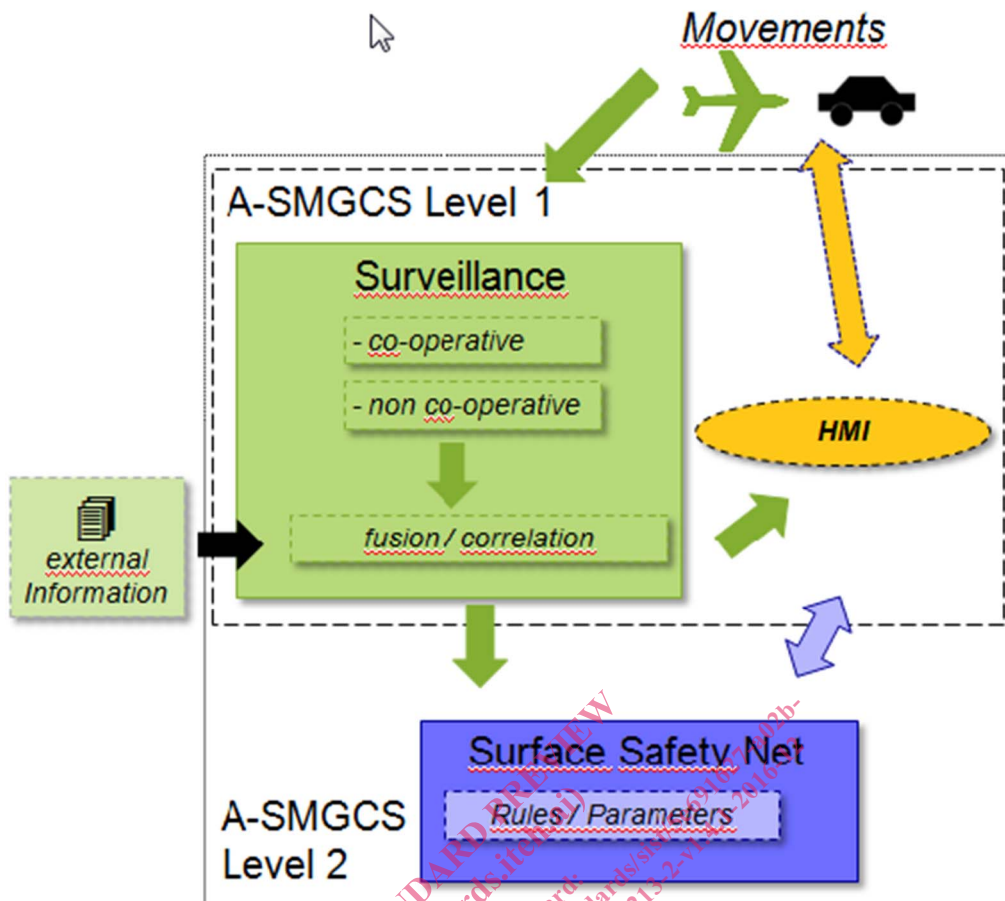


Figure 1: A-SMGCS Level 1 and 2 Functional Configuration

Advanced Surface Movement Guidance and Control System (A-SMGCS): system providing routing, guidance, surveillance for the control to aircraft and vehicles in order to maintain the declared surface movement rate under all local weather conditions within the aerodrome visibility operational Level (AVOL) while maintaining the required level of safety

NOTE: This definition is derived from the ICAO Document 9830 [i.4].

A-SMGCS Level 1: A-SMGCS including a comprehensive Surveillance element capable of the location and classification of all aircraft and vehicles within the area of interest and the identification of cooperative aircraft and vehicles

A-SMGCS Level 2: A-SMGCS including the capabilities of A-SMGCS Level 1 and uses the comprehensive surveillance data available to monitor the situation in the area of interest against a set of rules which will enable the system to alert the user to hazardous situations

aerodrome: defined area on land or water (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.4].

apron: defined area on a land 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.4].

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

availability: probability that a system or an item is in a functioning state at a given point in time

classification: function which groups targets into various types (e.g. large, medium, small)

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

NOTE: This is the legally binding definition in the context of Single European Sky [i.2].

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.4].

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

NOTE: This definition is derived from the ICAO Document 9830 [i.4].

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

NOTE: This is the legally binding definition in the context of Single European Sky [i.2].

reported velocity accuracy: difference, at a specified confidence level, between the reported Target velocity and the actual Target velocity at the time of the report

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

NOTE: This is the legally binding definition in the context of Single European Sky [i.2].

target: any aircraft, vehicle or obstacle, whether stationary or moving, which is located within the Coverage Volume of the A-SMGCS and which is operationally significant in the scope of A-SMGCS use

NOTE 1: Aircraft and vehicles are collectively referred to as mobiles.

NOTE 2: This definition is derived from EUROCAE ED-87C [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

3.2 Abbreviations

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

A-SMGCS	Advanced Surface Movement Guidance and Control Systems
ATC	Air Traffic Control
ATCO	Air Traffic Controller
ATM	Air Traffic Management
ATS	Air Traffic Service
EATMN	European Air Traffic Management Network
EC	European Communities
EN	European Norm
ER	Essential Requirement
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
IOP Regulation	InterOPERability Regulation
MASPS	Minimum Aviation Systems Performance Specification
SES	Single European Sky
SESAR	Single European Sky ATM Research
TMA	Terminal Manoeuvring Area

4 Requirements for design, implement, built, maintain and operate an A-SMGCS Level 2 System

4.1 Requirements for implementing A-SMGCS Level 2 Systems

4.1.1 Monitoring and alerting

The monitoring and alerting function shall comply with the requirements as defined in EUROCAE ED-87C [1], clause 3.4.

4.1.2 Velocity

The A-SMGCS System shall provide a Reported Velocity Accuracy as defined in EUROCAE ED-87C [1], clause 3.2.8.

4.1.3 Alert situation

The A-SMGCS System shall be able to distinguish between alert situations as defined in EUROCAE ED-87C [1], clause 3.4.1. Alert situations depending on routing functionality are excluded from this requirement.

4.1.4 Safety

4.1.4.1 Safety assessment

A safety assessment for A-SMGCS Level 2 system shall be provided. The objectives shall comply with the requirements as defined in Operational Concept and Requirements for A-SMGCS Implementation Level 2 [2], clause 2.1.

NOTE: The safety assessment may follow the methodology from A-SMGCS Levels 1&2 Preliminary Safety Case [3].

4.1.4.2 Service requirements

The A-SMGCS System shall comply with the services as defined in Operational Concept and Requirements for A-SMGCS Implementation Level 2 [2], clause 9.3.1 references Op_Serv-14-Service, Op_Serv-15-User, Op_Serv-16-Conflicts/infringements on runway, Op_Serv-17-Restricted area incursions, Op_Serv-18-Runway protection area, Op_Serv-19-Ground boundary, Op_Serv-20-Air boundary, Op_Serv-21-Traffic Context Update, Op_Serv-22-Alert, Op_Serv-27-Stages of alert, Op_Serv-28-Alert priority, Op_Serv-29-Adaptation to local procedures, Op_Serv-30-Traffic Information Update.

4.1.4.3 Safety net

The A-SMGCS System shall provide a safety net as defined in Operational Concept and Requirements for A-SMGCS Implementation Level 2 [2], clause 4 and clause 9.3.1 Op_Serv-29-Adaptation to local procedures.

4.1.4.4 Information to Vehicle Drivers

The A-SMGCS System shall provide information to the Vehicle Driver as defined in Operational Concept and Requirements for A-SMGCS Implementation Level 2 [2], clause 6.3. The requirement can also be fulfilled by providing the information manually by the controller.