



**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**

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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 present document has been produced by ETSI in response to mandate M/390 from the European Commission issued under Council Directive 98/34/EC [i.5] (as amended) laying down a procedure for the provision of information in the field of technical standards and regulations. 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 as defined in the Regulation (EC) N°716/2014 [i.8] (the "PCP regulation").

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) 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.6] 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 3 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 surveillance service including external interfaces";
- Part 2: "Community Specification for application under the Single European Sky Interoperability Regulation EC 552/2004 for A-SMGCS airport safety support service";
- 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 for access to the radio spectrum 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";
- Part 7: "Community Specification for application under the Single European Sky Interoperability Regulation EC 552/2004 for A-SMGCS routing service";
- Part 8: "Community Specification for application under the Single European Sky Interoperability Regulation EC 552/2004 for A-SMGCS guidance service".

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).

"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.6].

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 [i.4] endorsing the European Air Traffic Management Master Plan of the Single European Sky ATM Research (SESAR) project.

This updated version takes into account the updated referenced documents from EUROCONTROL as well as Regulation (EC) No 716/2014 [i.8] (the "PCP regulation").

1 Scope

The present document is applicable to 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 on the entire manoeuvring and movement area of aerodromes.

The present document provides a European Standard for Air Navigation Service Providers and/or Airport Operators, who have to demonstrate and declare compliance of their systems and procedures to the IOP regulation [i.1].

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, 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.

Requirements in the present document which refer to "should" statements or recommendations in the normatively referenced material (clause 2.1) are only 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.

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

NOTE 2: Currently there are no relevant Implementing Rules for A-SMGCS.

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-117A, September 2016: "Minimum Operational Performance Specification for Mode S Multilateration Systems for use in Advanced Surface Movement Guidance and Control Systems (A-SMGCS)".
- [2] EUROCAE ED-87C, January 2015: "MASPS for Advanced Surface Movement Guidance and Control Systems (A-SMGCS)".
- [3] EUROCONTROL-SPEC-171: "EUROCONTROL Specification for Advanced-Surfaced Movement Guidance and Control System (A-SMGCS) Services" (Edition 1, March 2018).
- [4] ETSI EN 300 019-1-3 (V2.4.1) (04-2014): "Environmental Engineering (EE); Environmental conditions and environmental tests for telecommunications equipment; Part 1-3: Classification of environmental conditions; Stationary use at weatherprotected locations".

- [5] ETSI EN 300 019-1-4 (V2.2.1) (04-2014): "Environmental Engineering (EE); Environmental conditions and environmental tests for telecommunications equipment; Part 1-4: Classification of environmental conditions; Stationary use at non-weatherprotected locations".

2.2 Informative references

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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 (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] 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.3] ICAO Document 9830, AN/452: "Advanced Surface Movement Guidance and Control Systems (A-SMGCS) Manual", First Edition, 2004.
- [i.4] 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.5] 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.
- [i.6] 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.7] Void.
- [i.8] Regulation (EC) No 716/2014 of the European Parliament and of the Council of 27 June 2014 on the establishment of the Pilot Common Project supporting the implementation of the European Air Traffic Management Master Plan.
- [i.9] ETSI EN 303 213-1: "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".
- [i.10] ETSI EN 303 213-2: "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".
- [i.11] ETSI EN 303 213-4 (all sub-parts): "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.12] ETSI EN 303 213-7: "Advanced Surface Movement Guidance and Control System (A-SMGCS); Part 7: Community Specification for application under the Single European Sky Interoperability Regulation EC 552/2004 for A-SMGCS routing service".

- [i.13] ETSI EN 303 213-8: "Advanced Surface Movement Guidance and Control System (A-SMGCS); Part 8: Community Specification for application under the Single European Sky Interoperability Regulation EC 552/2004 for A-SMGCS guidance service".

3 Definition of terms and abbreviations

3.1 Terms

For the purposes of the present document, the terms given in clause 1.4.1 of ED-117A [1], clause 1.7 of EUROCONTROL Specification for A-SMGCS Services [3] and the following apply:

advanced surface movement guidance and control system: system providing as a minimum surveillance

NOTE 1: It 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 2: This definition is derived from the EUROCONTROL Specification for A-SMGCS Services [i.3].

aerodrome: 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.3].

apron: 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.3].

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

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

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.3].

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.3].

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].

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: vehicle or aircraft equipped with a Mode S, Mode A/C transponder or non-transponder device, which has been turned on and is functioning in compliance with its minimum operational performance specification

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

NOTE 2: This definition is derived from EUROCAE ED-117A [1].

test targets: form of either fixed reflectors or active devices transponders, mounted at fixed positions or moving (with a known reference position) 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
ASTERIX	All-purpose Structured EUROCONTROL Surveillance Information Exchange
ATC	Air Traffic Control
ATM	Air Traffic Management
ATS	Air Traffic Service
CS	Community Specification
doa	date of announcement
dow	date of withdrawal
EATMN	European Air Traffic Management Network
EC	European Communities
EN	European Norm - (standard)
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
MLAT	MuLtilATERation
PRA	Position Registration Accuracy
SES	Single European Sky
TMA	Terminal Manoeuvring Area

4 Requirements for implementing cooperative sensors for A-SMGCS Systems

4.1 Design Requirements for cooperative sensors for A-SMGCS Systems

4.1.1 Operating principles of the cooperative sensor

The operating principles of the cooperative sensor are defined in ED-117A [1], clause 1.6.2. The cooperative sensor shall receive Mode S messages as defined in ED-117A [1], clause 2.4.1 [REQ 5.].

4.1.2 Certification

The cooperative sensor shall comply with the requirements as defined in ED-117A [1], clause 2.3, [REQ 1.] and clause 2.8.1 [REQ 24.].

4.1.3 Software and Hardware Design

The Software and the design of the cooperative sensor shall comply with the requirements as defined in ED-117A [1], clause 2.1 [REQ 1.], [REQ 2.], [REQ 3.], [REQ 4.] and clause 2.8 [REQ 22.], [REQ 23.], [REQ 25.] and [REQ 26.] and clause 2.9. All MLAT electrical equipment shall operate from standard mains voltage and frequency at the Aerodrome as defined in ED-117A [1], clause 2.8 [REC 17].

4.1.4 Capacity

The capacity of the cooperative sensor shall comply with the requirements as defined in ED-117A [1] 3.3.12. [REQ 66.], [REQ 67.] and [REQ 68.].

4.1.5 Void

4.1.6 System coverage

The system coverage of the cooperative sensor shall comply with the requirements as defined in ED-117A [1], clause 3.1.1 [REQ 27.] and clause 3.3.2 [REQ 56.].

4.1.7 Identification

The identification within the cooperative sensor shall comply with the requirements as defined in ED-117A [1], clause 3.3.6 [REQ 60.], clause 3.3.7 [REQ 61.], clause 3.3.8 [REQ 62.] and ED-87C [2] 2.3.1.1.

4.1.8 Surveillance data output

The surveillance data output of the cooperative sensor shall comply with the requirements as defined in ED-117A [1], clause 2.4.2 [REQ 6.] and [REQ 7.], clause 3.1.6 [REQ 44.], [REQ 45.], [REQ 46.], clause 3.1.6.1 [REQ 48.], clause 3.1.6.2 [REQ 50.], clause 3.1.6.3 [REQ 51.] and [REQ 52.] and ED-87C [1] 2.3.1.2. As defined in ED-117A [1], clause 3.1.6, the MLAT System shall output MLAT Target Reports in accordance with ASTERIX Category 10 to support legacy systems.

4.1.9 Update Rate

The Target Report Update Rate of the cooperative sensor shall comply with the requirements as defined in ED-117A [1], clause 3.1.6.3 [REQ 51.] and clause 3.3.3 [REQ 57.].

4.1.10 Integrity

The Integrity of the cooperative sensor shall comply with the requirements as defined in ED-117A [1], clause 2.7. [REQ 21.].

As defined in ED-117A [1], clause 2.7 [REC 13.], mechanisms shall be put into place to inform the users of areas where performance has been reduced in a way that may affect the operation.

As defined in ED-117A [1], clause 2.7 [REC 14.], sensor cases and antennas shall be mounted on a suitable building, mast, or tower.

As defined in ED-117A [1], clause 2.7 [REC 15.], the stability of the installation site shall ensure system performance requirements under all specified operating weather conditions, in particular the specified operating wind speed and ice loading.

4.1.11 Expandability

The cooperative sensor shall be expandable as defined in ED-117A [1], clause 2.9.5 [REC 19.].