

**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**

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# Contents

Intellectual Property Rights .....	5
Foreword.....	5
Introduction .....	6
1 Scope .....	7
2 References .....	7
2.1 Normative references .....	7
2.2 Informative references.....	8
3 Definitions and abbreviations.....	9
3.1 Definitions.....	9
3.2 Abbreviations .....	11
4 Requirements for implementing non-cooperative sensors for A-SMGCS Systems.....	11
4.1 Design Requirements for non-cooperative sensors for A-SMGCS Systems.....	11
4.1.1 Surveillance Element .....	11
4.1.2 Operation of Controls .....	11
4.1.3 Coverage.....	11
4.1.4 Antenna Unit.....	11
4.1.5 Transmitter and Receiver.....	12
4.1.6 Interfaces.....	12
4.1.6.1 Equipment Interfaces .....	12
4.1.6.2 Datafusion .....	12
4.1.7 External time reference .....	12
4.1.8 Safety .....	12
4.1.8.1 Health and Safety .....	12
4.1.8.2 Safety interlocks.....	12
4.1.8.3 Grounding .....	12
4.1.8.4 Lightning protection.....	12
4.1.9 Power supplies .....	12
4.1.10 Reliability, availability and integrity .....	12
4.1.11 Temperature and Humidity .....	12
4.2 Acceptance testing requirements for non-cooperative sensors for A-SMGCS Systems .....	13
4.2.1 Environmental testing procedures.....	13
4.2.2 Factory testing procedures .....	13
4.2.3 Site testing procedures.....	14
4.3 Maintenance Requirements for non-cooperative sensors for A-SMGCS Systems.....	14
4.4 Requirements for operation non-cooperative sensors for A-SMGCS Systems .....	14
4.5 Environment .....	14
4.5.1 Electromagnetic interference and susceptibility .....	14
4.5.2 Noise and vibration.....	14
5 Testing.....	14
<b>Annex SA (normative): Standards Annex.....</b>	<b>15</b>
SA1: Correspondence between the present document and the Single European Sky Interoperability Regulation for the A-SMGCS non-cooperative sensor constituent.....	15
<b>Annex A (normative): Checklist .....</b>	<b>18</b>
A.1 Interoperability Regulation Annex II Essential Requirements; Part A: General requirements.....	19
A.2 Interoperability Regulation Annex II Essential Requirements; Part B: Specific requirements.....	22
A.2.1 Systems and procedures for airspace management.....	22
A.2.2 Systems and procedures for air traffic flow management .....	23
A.2.3 Systems and procedures for air traffic services .....	23
A.2.3.1 Flight data processing systems.....	23

A.2.3.2	Surveillance data processing systems .....	24
A.2.3.3	Human-machine interface systems .....	25
A.2.4	Communications systems and procedures for ground-to-ground, air-to-ground and air-to-air communications .....	26
A.2.5	Navigation systems and procedures .....	26
A.2.6	Surveillance systems and procedures .....	27
A.2.7	Systems and procedures for aeronautical information services .....	27
A.2.8	Systems and procedures for the use of meteorological information .....	28
<b>Annex B (informative):</b>	<b>The EN title in the official languages .....</b>	<b>29</b>
<b>Annex C (informative):</b>	<b>Bibliography .....</b>	<b>30</b>
History .....		31

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## Foreword

This European Standard (Telecommunications series) has been produced by ETSI Technical Committee Aeronautics (AERO), and is now submitted for the Public Enquiry phase of the ETSI standards Two-step Approval Procedure.

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 for compliance with the 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 Sky Interoperability Regulation.

The presumption of conformity which is linked to the full application of EN 303 213 (parts 1 to 4) can only be claimed after 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.8] 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 4, sub-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 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":**

**Sub-part 1: "Generic requirements for a non-cooperative sensor";**

Sub-part 2: "Specific requirements for a deployed Surface Movement Radar sensor".

Part 5: "Harmonized EN covering the essential requirements of article 3.2 of the R&TTE Directive for transmitters used in multilateration equipment";

Part 6: "Harmonized EN covering the essential requirements of article 3.2 of the R&TTE Directive for deployed surface movement radar sensors".

<b>Proposed national transposition dates</b>	
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):	18 months after doa

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## 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.8].

The SES legislation is based on a framework of 4 regulations, which includes "the Interoperability Regulation" (EC 552/2004 [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 [i.4].

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# 1 Scope

The present document is applicable to deployed non-cooperative sensor as a constituent of an Advanced Surface Movement Guidance and Control System.

The present document provides a European Standard for manufacturers of the non-cooperative sensor constituent, who have to demonstrate and declare conformity for their constituent 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: 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 to be interpreted as fully normative ("shall") for the purpose of compliance with the present document.

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# 2 References

References are either specific (identified by date of publication and/or edition number or version number) or non-specific.

- For a specific reference, subsequent revisions do not apply.
- Non-specific reference may be made only to a complete document or a part thereof and only in the following cases:
  - if it is accepted that it will be possible to use all future changes of the referenced document for the purposes of the referring document;
  - for informative references.

Referenced documents which are not found to be publicly available in the expected location might be found at <http://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.

## 2.1 Normative references

The following referenced documents are indispensable for the application of the present document. For dated references, only the edition cited applies. For non-specific references, the latest edition of the referenced document (including any amendments) applies.

- [1] EUROCAE ED-87B (ED-87B including Amendment No 1 published 01/2009): "MASPS for Advanced Surface Movement Guidance and Control Systems".
- [2] EUROCAE ED-116 (ED-116 January 2004): "MOPS for Surface Movement Radar Sensor Systems for Use in A-SMGCS".

## 2.2 Informative references

The following referenced documents are not essential to the use of the present document but they assist the user with regard to a particular subject area. For non-specific references, the latest version of the referenced document (including any amendments) applies.

- [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] ETSI EN 303 213-6: "Advanced Surface Movement Guidance and Control System (A-SMGCS); Part 6: Harmonized EN covering the essential requirements of article 3.2 of the R&TTE Directive for deployed surface movement radar sensors".
- [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] EUROCAE ED-128 (ED-128 published 08/2007): Guidelines for surveillance data fusion in advanced surface movement guidance and control systems (A-SMGCS) levels 1 and 2.
- [i.6] ICAO Document 9830, AN/452, Advanced Surface Movement Guidance and Control Systems (A-SMGCS) Manual, First Edition, 2004.
- [i.7] Directive 1999/5/EC of the European Parliament and of the Council of 9 March 1999 on radio equipment and telecommunications terminal equipment and the mutual recognition of their conformity (R&TTE Directive) (OJ L 91, 07.04.1999).
- [i.8] 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.9] IEC 60068-2-1: "Environmental testing - Part 2-1: Tests - Test A: Cold".
- [i.10] IEC 60945: "Maritime navigation and radiocommunication equipment and systems - General requirements - Methods of testing and required test results".
- [i.11] IEC 60068-2-2: "Environmental testing - Part 2-2: Tests - Test B: Dry heat".
- [i.12] ISO 3743: "Acoustics - Determination of sound power levels of noise sources - Engineering methods for small, movable sources in reverberant fields".
- [i.13] 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.14] 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.15] 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.16] ETSI EN 303 213-5: "Advanced Surface Movement Guidance and Control System (A-SMGCS); Part 5: Harmonized EN covering the essential requirements of article 3.2 of the R&TTE Directive for transmitters used in multilateration equipment".
- [i.17] CENELEC EN 55022: "Information technology equipment - Radio disturbance characteristics - Limits and methods of measurement".



- [i.18] CENELEC EN 61000-3-2: "Electromagnetic compatibility (EMC) - Part 3-2: Limits - Limits for harmonic current emissions (equipment input current  $\leq$  16 A per phase)".
- [i.19] CENELEC EN 61000-3-3: "Electromagnetic compatibility (EMC) - Part 3-3: Limits - Limitation of voltage changes, voltage fluctuations and flicker in public low-voltage supply systems, for equipment with rated current  $\leq$  16 A per phase and not subject to conditional connection".
- [i.20] CENELEC EN 61000-4-2: "Electromagnetic compatibility (EMC) - Part 4-2: Testing and measurement techniques - Electrostatic discharge immunity test".
- [i.21] CENELEC EN 61000-4-3: "Electromagnetic compatibility (EMC) - Part 4-3: Testing and measurement techniques - Radiated, radio-frequency, electromagnetic field immunity test".
- [i.22] CENELEC EN 61000-4-4: "Electromagnetic compatibility (EMC) - Part 4-4: Testing and measurement techniques - Electrical fast transient/burst immunity test".
- [i.23] CENELEC EN 61000-4-5: "Electromagnetic compatibility (EMC) - Part 4-5: Testing and measurement techniques - Surge immunity".
- [i.24] CENELEC EN 61000-4-6: "Electromagnetic compatibility (EMC) - Part 4-6: Testing and measurement techniques - Immunity to conducted disturbances, induced by radio-frequency fields".
- [i.25] CENELEC EN 61000-4-11: "Electromagnetic compatibility (EMC) - Part 4-11: Testing and measurement techniques - Voltage dips, short interruptions and voltage variations immunity tests".
- [i.26] IEC 60529: "Degrees of protection provided by enclosures (IP Code)".
- [i.27] ISO 3746: "Acoustics -- Determination of sound power levels of noise sources using sound pressure - Survey method using an enveloping measurement surface over a reflecting plane".

## 3 Definitions and abbreviations

### 3.1 Definitions

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

**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

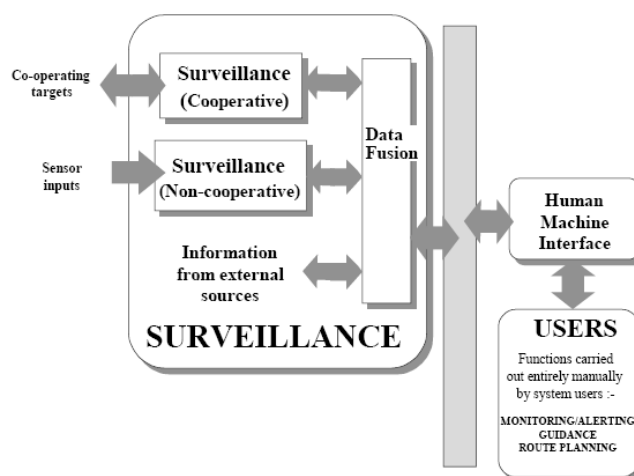
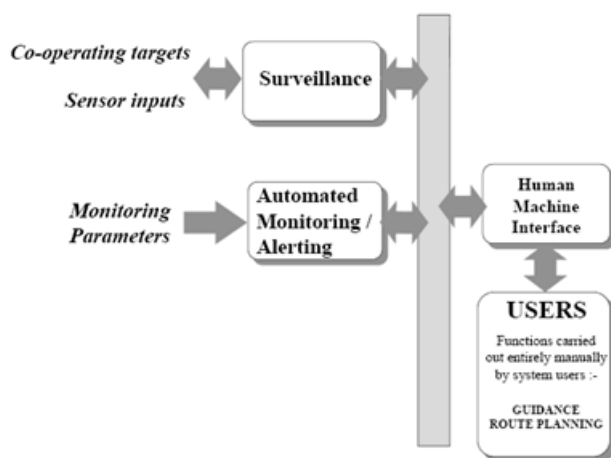


Figure 1: A-SMGCS Level 1 Functional Configuration

**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



**Figure 2: A-SMGCS Level 2 Functional Configuration**

**Advanced Surface Movement Guidance and Control Systems:** systems providing routing, guidance, surveillance for the control of 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.6].

**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.6].

**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: This definition is derived from the ICAO Document 9830 [i.6].

**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.6].

**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.6].

**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 groundbased 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:** aircraft, vehicle or obstacle that is displayed on a surveillance display

NOTE: This definition is derived from the ICAO Document 9830 [i.6].

**update:** renewal of target reports relating to all targets under surveillance

Further legally binding definitions in the context of Single European Sky are given in [i.2].

## 3.2 Abbreviations

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

A-SMGCS	Advanced Surface Movement Guidance and Control Systems
ATM	Air Traffic Management
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
ICAO	International Civil Aviation Organization
IOP Regulation	InterOPERability Regulation
MASPS	Minimum Aviation Systems Performance Specification
SES	Single European Sky
SMR	Surface movement radar

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## 4 Requirements for implementing non-cooperative sensors for A-SMGCS Systems

This clause defines the minimum requirements for implementing a non-cooperative sensor into an A-SMGCS System.

### 4.1 Design Requirements for non-cooperative sensors for A-SMGCS Systems

#### 4.1.1 Surveillance Element

The non-cooperative sensor shall be designed as a Surveillance Element for an A-SMGCS System and provide an interface as defined in ED-87B [1], clause 2.5.1.1.

#### 4.1.2 Operation of Controls

The constituent shall be designed in respect of operation of Controls as defined in ED-116 [2], clause 2.3.

#### 4.1.3 Coverage

The constituent shall have the minimum coverage as defined in ED-116 [2], clause 2.8.

#### 4.1.4 Antenna Unit

The constituent shall have the antenna unit characteristics as defined in ED-116 [2], clause 2.9.