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Englische Fassung prEN 16603-10-24:2016**

Space engineering –  
Interface management;  
English version prEN 16603-10-24:2016

Ingénierie spatiale –  
Gestion des interfaces;  
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**Anwendungswarnvermerk**

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Weil die beabsichtigte Norm von der vorliegenden Fassung abweichen kann, ist die Anwendung dieses Entwurfes besonders zu vereinbaren.

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Gesamtumfang 59 Seiten

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## **Nationales Vorwort**

Dieses Dokument (prEN 16603-10-24:2016) wurde im Technischen Komitee CEN/CLC/TC 5 „Raumfahrt“, dessen Sekretariat von DIN (Deutschland) gehalten wird, erarbeitet.

Das zuständige deutsche Normungsgremium ist der Arbeitsausschuss NA 131-06-02 AA „Interoperabilität von Informations-, Kommunikations- und Navigationssystemen (Spiegelausschuss zu CEN/CLC/TC 5)“ im DIN-Normenausschuss Luft- und Raumfahrt (NL).

Dieses Dokument (prEN 16603-10-24:2016) basiert auf ECSS-E-ST-10-24C.

Dieses Dokument enthält unter Berücksichtigung des DIN-Präsidialbeschlusses 1/2004 nur die englische Originalfassung von prEN 16603-10-24:2016.

Dieses Dokument wurde speziell zur Behandlung von Raumfahrtsystemen erarbeitet und hat daher Vorrang vor jeglicher Europäischer Norm, die denselben Anwendungsbereich hat, jedoch über einen größeren Geltungsbereich (z. B. Luft- und Raumfahrt) verfügt.

## **Nationaler Anhang NA** (informativ)

### **Begriffe und Abkürzungen**

### **3 Begriffe, Definitionen und Abkürzungen**

#### **3.1 Begriffe aus anderen Normen**

- a) In dieser Norm finden die Begriffe der ECSS-S-ST-00-01 Anwendung, insbesondere die folgenden Begriffe:
  - 1) Zulassung
  - 2) Grundlage
  - 3) Konfigurationsgrundlage
  - 4) Kunde
  - 5) Schnittstelle
  - 6) Lieferant
- b) In dieser Norm finden die folgenden Begriffe der ECSS-S-ST-10-06 Anwendung:
  - 1) Anforderungsnachweis
- c) In dieser Norm finden die folgenden Begriffe der ECSS-S-ST-10-40 Anwendung:
  - 1) Änderungsanforderung
  - 2) Änderungsvorschlag

#### **3.2 Spezifische Begriffe dieser Norm**

##### **3.2.1 kontrolliertes ICD**

Formal ausgestelltes ICD gemäß Konfigurationsüberwachungsprozess

##### **3.2.2 externe Schnittstelle**

Schnittstelle zwischen Einheiten mit verschiedenen Programmverantwortlichkeiten

##### **3.2.3 eingefrorenes ICD**

Formal ausgestelltes ICD gemäß Konfigurationsüberwachungsprozess und unterzeichnet von Schnittstellenverantwortlichen sowie allen involvierten Beteiligten

ANMERKUNG 1 Ein „eingefrorenes“ ICD gibt die Gestaltungsgrundlage wieder, die für die mit der Schnittstelle verknüpften Aspekte als endgültig und vollständig gilt, um Fertigungsbeginn, Integration, Implementierung und Prüfungsaktivitäten zu ermöglichen.

ANMERKUNG 2 Eine Änderung eines „eingefrorenen ICD kann erfolgen, bringt jedoch üblicherweise erhebliche Kosten oder Auswirkungen auf den Zeitplan mit sich.

### **3.2.4 Schnittstellenakteur**

<KONTEXT: Rolle> verantwortlich für die Gestaltung, Entwicklung und Verifizierung des Schnittstellenendes

ANMERKUNG Die Schnittstellenakteure sind alle Beteiligten, die an den Schnittstellenenden Definition, Design, Entwicklung involviert sind.

### **3.2.5 Schnittstellenüberwachungsdokument (ICD)**

Dokument, das das Design des (der) Schnittstelle(n) definiert

### **3.2.6 Schnittstellendefinitionsdokument (IDD)**

Dokument, das das Design eines Schnittstellenendes definiert

### **3.2.7 Schnittstellenende**

eine Seite einer Schnittstelle

ANMERKUNG Ein Schnittstellenende ist der Interaktionspunkt eines Elements an einer Schnittstelle.

### **3.2.8 Schnittstellenidentifikationsdokument**

Dokument, das den Index aller identifizierten Schnittstellen definiert

### **3.2.9 Schnittstellenflächen**

Fläche, die zwei Schnittstellenenden erkennt, die sich miteinander verbinden

### **3.2.10 Schnittstellenanforderungsdokument (IRD)**

Dokument, das die Anforderungen für eine Schnittstelle oder eine Sammlung von Schnittstellen definiert.

### **3.2.11 Schnittstellenverantwortlicher**

<KONTEXT: Rolle> verantwortlich für die Anforderungsliste, Definition, Entwicklung und Verifizierung der Schnittstelle

ANMERKUNG Der Schnittstellenverantwortliche ist der Kunde oder sein Stellvertreter, beispielsweise ist er beim Raumsegment verantwortlich für die Startsegmentschnittstelle, es ist die Instanz, bei der beide oder seine Stellvertreter vermitteln.

### **3.2.12 interne Schnittstelle**

Schnittstelle zwischen Einheiten innerhalb der gleichen Programmverantwortlichkeit

### **3.2.13 vorläufiges ICD**

Entwurf eines ICD, das während der Schnittstellendefinitionsphase vor Ausstellung eines endgültig überprüften ICD verbreitet und erneut verbessert wurde

### **3.3 Abkürzungen**

In dieser Norm finden die Abkürzungen der ECSS-S-ST-00-01 und die folgenden Begriffe Anwendung:

| <b>Abkürzung</b> | <b>Bedeutung</b>                                                                                     |                                                      |
|------------------|------------------------------------------------------------------------------------------------------|------------------------------------------------------|
| <b>CCSDS</b>     | Beratungsausschuss für Raumfahrtdateisysteme                                                         | (en: Consultative Committee for Space Data Systems)  |
| <b>CR</b>        | Änderungsanforderung                                                                                 | (en: change request)                                 |
| <b>CP</b>        | Änderungsvorschlag                                                                                   | (en: change proposal)                                |
| <b>ECSS</b>      | Europäische Kooperation für Raumfahrtnormung<br>(en: European Cooperation for Space Standardization) | (en: European Cooperation for Space Standardization) |
| <b>ICD</b>       | Schnittstellenidentifikationsdokument                                                                | (en: interface control document)                     |
| <b>IDD</b>       | Schnittstellendefinitionsdokument                                                                    | (en: interface definition document)                  |
| <b>IID</b>       | Schnittstellenidentifikationsdokument                                                                | (en: interface identification document)              |
| <b>IRD</b>       | Schnittstellenanforderungsdokument                                                                   | (en: interface requirements document)                |
| <b>OTS</b>       | Serienmäßig produziert                                                                               | (en: off-the-shelf)                                  |

— Leerseite —

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English version

## Space engineering - Interface management

Ingénierie spatiale - Gestion des interfaces

Raumfahrttechnik - Schnittstellenmanagement

This draft European Standard is submitted to CEN members for enquiry. It has been drawn up by the Technical Committee CEN/CLC/TC 5.

If this draft becomes a European Standard, CEN and CENELEC members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this European Standard the status of a national standard without any alteration.

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Recipients of this draft are invited to submit, with their comments, notification of any relevant patent rights of which they are aware and to provide supporting documentation. Recipients of this draft are invited to submit, with their comments, notification of any relevant patent rights of which they are aware and to provide supporting documentation.

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## European foreword

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This document (prEN 16603-10-24:2016) has been prepared by Technical Committee CEN/CLC/TC 5 “Space”, the secretariat of which is held by DIN (Germany).

This document (prEN 16603-10-24:2016) originates from ECSS-E-ST-10-24C.

This document is currently submitted to the CEN Enquiry.

This document has been developed to cover specifically space systems and will therefore have precedence over any EN covering the same scope but with a wider domain of applicability (e.g. : aerospace).

## Introduction

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The management and control of interfaces is crucial to the success of space programmes and projects. Interface management is a process to assist in controlling product development when efforts are divided amongst different parties (e.g. agencies, contractors, geographically dispersed technical teams). Interface control is also needed to define, achieve and maintain compliance between products and actors that interoperate.

The application of this standard to a project is expected to bring the following benefits:

- a consistent, coherent and commonly used approach – including documentation – throughout industry and across different projects;
- effective and efficient product interface management;
- minimize the risk of interface incompatibilities;
- high confidence in achieving successful product operations for the intended use.

# 1

## Scope

---

The objective of interface management is to achieve functional and physical compatibility amongst all interrelated items in the product tree. The goal of this standard is to define a common and systematic process to meet the objective.

This standard describes a standard process and methodology for interface management throughout the life cycle, in terms of identification, requirements specification, definition, approval and control, implementation, verification and validation of interfaces, within a space programme or project and in accordance with the other relevant ECSS standards.

In line with the definition of the Space System breakdown in Figure 2-1 of ECSS-S-ST-00-01, this standard is applicable to the following interfaces, where a contractual relationship exist among parties:

- within the Space Segment
- within the Ground Segment
- between the Space Segment and the Ground Segment
- between Space Segment and Launch Segment only for ICD aspects in conformance to the launcher user manual.

This standard does not ensure that all the specificities of interfaces within the Launch Segment are covered.

This standard is applicable to development of products at all different levels in the product tree. It is applicable to both the customer and the supplier of the product during all project phases (0 to F) and follows the generic ECSS customer/supplier pattern.

This standard may be tailored for the specific characteristics and constrains of a space project in conformance with ECSS-S-ST-00.

## 2

# Normative references

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The following normative documents contain provisions which, through reference in this text, constitute provisions of this ECSS Standard. For dated references, subsequent amendments to, or revision of any of these publications do not apply. However, parties to agreements based on this ECSS Standard are encouraged to investigate the possibility of applying the more recent editions of the normative documents indicated below. For undated references, the latest edition of the publication referred to applies.

| EN reference   | Reference in text | Title                                                               |
|----------------|-------------------|---------------------------------------------------------------------|
| EN 16601-00-01 | ECSS-S-ST-00-01   | ECSS - Glossary of terms                                            |
| EN 16003-10    | ECSS-E-ST-10      | Space engineering - System engineering general requirements         |
| EN 16003-10-02 | ECSS-E-ST-10-02   | Space engineering - Verification                                    |
| EN 16003-10-06 | ECSS-E-ST-10-06   | Space engineering - Technical requirements specification            |
| EN 16001-10    | ECSS-M-ST-10      | Space project management - Project planning and implementation      |
| EN 16001-40    | ECSS-M-ST-40      | Space project management - Configuration and information management |
| EN 16002-10-09 | ECSS-Q-ST-10-09   | Space product assurance - Nonconformance control system             |

## Terms, definitions and abbreviated terms

---

### 3.1 Terms from other standards

- a. For the purpose of this Standard, the terms and definitions from ECSS-S-ST-00-01 apply, in particular for the following terms:
  - 1. approval
  - 2. baseline
  - 3. configuration baseline
  - 4. customer
  - 5. interface
  - 6. supplier
- b. For the purpose of this Standard, the following term and definition from ECSS-E-ST-10-06 applies:
  - 1. verification requirements
- c. For the purpose of this Standard, the following terms and definitions from ECSS-M-ST-40 apply:
  - 1. change request
  - 2. change proposal

### 3.2 Terms specific to the present standard

#### 3.2.1 controlled ICD

ICD formally issued subject to configuration control process

#### 3.2.2 external interface

interface between items under different programme responsibilities

#### 3.2.3 frozen ICD

ICD formally issued subject to configuration control process and signed by interface responsible and all the involved actors

NOTE 1 A “frozen” ICD reflects the design baseline that is considered, for the interface related aspects, to be final and complete allowing start of manufacturing, integration, implementation and testing activities.

NOTE 2 Change of a “frozen” ICD can occur but it usually implies a major cost or schedule impact.

#### **3.2.4 interface actor**

<CONTEXT:role> responsible for the design, development and verification of one interface end

NOTE The interface actors are all parties involved in the interface ends definition, design, development.

#### **3.2.5 interface control document (ICD)**

document defining the design of the interface(s)

#### **3.2.6 interface definition document (IDD)**

document defining the design of one interface end

#### **3.2.7 interface end**

one side of an interface

NOTE An interface end is the point of interaction of one of the elements of an interface.

#### **3.2.8 interface identification document**

document defining the index of all identified interfaces

#### **3.2.9 interface plane**

plane that distinguishes the two interface ends that interface with each other

#### **3.2.10 interface requirement document (IRD)**

document defining the requirements for an interface or a collection of interfaces.

#### **3.2.11 interface responsible**

<CONTEXT:role> responsible for the requirement specification, definition, development and verification of the interface

NOTE The interface responsible is the customer or his delegate, as an example for space segment to launch segment interface, it is the entity procuring both or its delegates.

#### **3.2.12 internal interface**

interface between items within the same programme responsibility

#### **3.2.13 preliminary ICD**

draft ICD circulated and iterated during interface definition phase before issuing a controlled ICD

### 3.3 Abbreviated terms

For the purpose of this Standard, the abbreviated terms from ECSS-S-ST-00-01 and the following apply:

| Abbreviation | Meaning                                        |
|--------------|------------------------------------------------|
| CCSDS        | Consultative Committee for Space Data Systems  |
| CR           | change request                                 |
| CP           | change proposal                                |
| ECSS         | European Cooperation for Space Standardization |
| ICD          | interface control document                     |
| IDD          | interface definition document                  |
| IID          | interface identification document              |
| IRD          | interface requirements document                |
| OTS          | off-the-shelf                                  |

### 3.4 Nomenclature

The following nomenclature applies throughout this document:

- a. The word “shall” is used in this Standard to express requirements. All the requirements are expressed with the word “shall”.
- b. The word “should” is used in this Standard to express recommendations. All the recommendations are expressed with the word “should”.

NOTE It is expected that, during tailoring, recommendations in this document are either converted into requirements or tailored out.

- c. The words “may” and “need not” are used in this Standard to express positive and negative permissions, respectively. All the positive permissions are expressed with the word “may”. All the negative permissions are expressed with the words “need not”.
- d. The word “can” is used in this Standard to express capabilities or possibilities, and therefore, if not accompanied by one of the previous words, it implies descriptive text.

NOTE In ECSS “may” and “can” have completely different meanings: “may” is normative (permission), and “can” is descriptive.

- e. The present and past tenses are used in this Standard to express statements of fact, and therefore they imply descriptive text.

# 4

## Principles

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### 4.1 Type of interfaces

In a Space System there can be three major types of interfaces.

- interfaces within the Space Segment, Ground Segment or Launch Segment.
- interfaces between the different Segments of the Space System.
- interfaces between the Support Segment and the Space Segment, Ground Segment or Launch Segment.

Refer to Figure 2-1 of ECSS-S-ST-00-01 for details on Space System breakdown.

In addition, a distinction can be made between internal and external interfaces.

The notion of internal or external depends on the position and role of an actor in the customer supplier chain.

An internal interface is an interface under the control of a given actor.

An external interface is an interface outside the control of a given actor.

For example, an interface between two suppliers of the same customer is considered external by the suppliers and internal by the customer.

### 4.2 Interface management process

#### 4.2.1 General description

The interface management process is applied at all levels of the supplier/customer chain.

The standard describes the process at one level, between one customer and its lower tier suppliers.

The customer or his delegate is responsible for the definition, development and verification of the interface.

In addition to the interface responsible, the interface actors are all the parties involved in the interface end definition, design, development.

This process can impact the similar activities done at higher or lower levels.

As per ECSS-S-ST-00-01, the term “product” is used in the standard as a generic term which defines any component, equipment or element.

Annex E provides a non-exhaustive list of interface data, that can be used as a basis for interface specification, definition and control.

Figure 4-1 provides an overview of the interface management process.

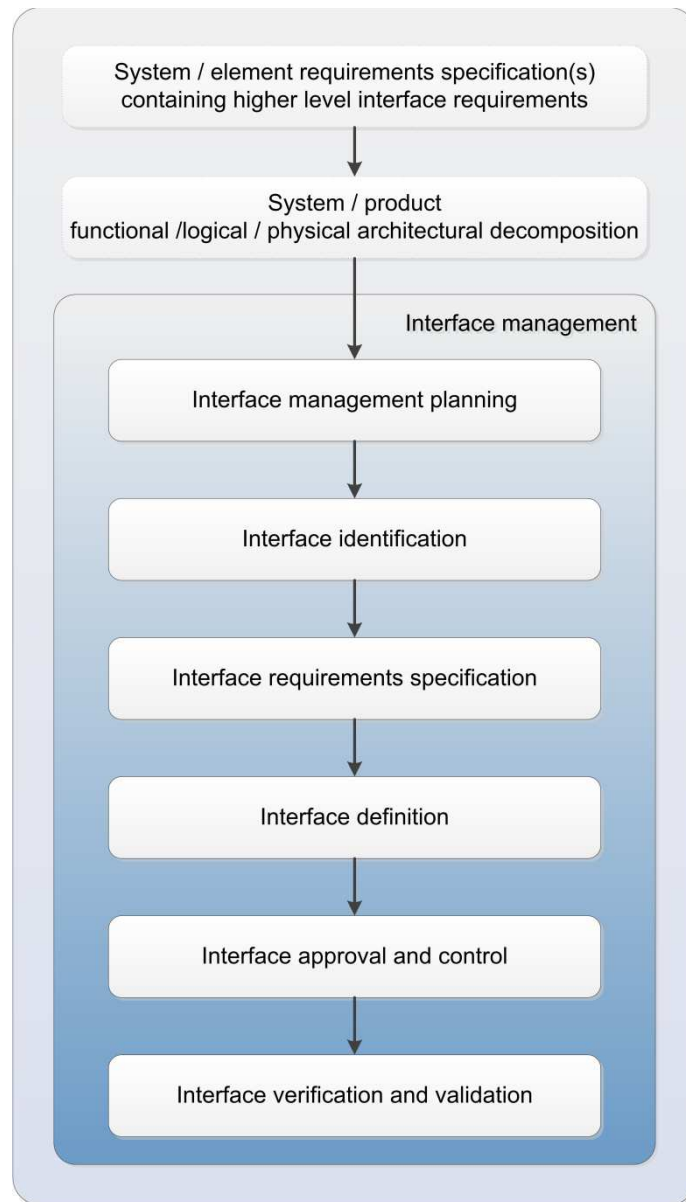


Figure 4-1 Interface management process – overview of the main process steps

## 4.2.2 Interface management planning

At the beginning of the project, each customer defines the approach, the requirements, the responsibilities and the planning for the management of the interfaces.

## 4.2.3 Interface identification

At the beginning of the project, each customer identifies the interfaces under his responsibility.