
**Space data and information transfer
systems — Space link extension (SLE) —
Return-channel-frames service**

*Systèmes de transfert des informations et données spatiales —
Extension de liaisons spatiales (SLE) — Service de réseau pour liaison
retour*





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Foreword

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Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights.

ISO 22670 was prepared by the Consultative Committee for Space Data Systems (CCSDS) (as CCSDS 911.2-B-2, January 2010) and was adopted (without modifications except those stated in Clause 2 of this International Standard) by Technical Committee ISO/TC 20, *Aircraft and space vehicles*, Subcommittee SC 13, *Space data and information transfer systems*.

This second edition cancels and replaces the first edition (ISO 22670:2006), which has been technically revised.

Space data and information transfer systems — Space link extension (SLE) — Return-channel-frames service

1 Scope

1.1 This International Standard defines the space link extension (SLE) return-channel-frames (RCF) service in accordance with the SLE Reference Model (CCSDS 910.4-B-2). The RCF service is an SLE transfer service that delivers to a mission user all telemetry frames from one master channel or one virtual channel.

1.2 This International Standard defines the RCF service in terms of

- a) the operations necessary to provide the service,
- b) the parameter data associated with each operation,
- c) the behaviors that result from the invocation of each operation, and
- d) the relationship between, and the valid sequence of, the operations and resulting behaviors.

1.3 It does not specify

- a) individual implementations or products,
- b) the implementation of entities or interfaces within real systems,
- c) the methods or technologies required to acquire telemetry frames from signals received from a spacecraft,
- d) the methods or technologies required to provide a suitable environment for communications, or
- e) the management activities required to schedule, configure, and control the RCF service.

1.4 The scope and field of application are furthermore detailed in subclauses 1.1, 1.2 and 1.3 of the enclosed CCSDS publication.

2 Requirements

Requirements are the technical recommendations made in the following publication (reproduced on the following pages), which is adopted as an International Standard:

CCSDS 911.2-B-2, January 2010, *Space link extension — Return channel frames service specification*.

For the purposes of international standardization, the modifications outlined below shall apply to the specific clauses and paragraphs of publication CCSDS 911.2-B-2.

Pages i to vi

This part is information which is relevant to the CCSDS publication only.

Pages 1-14 to 1-15

Add the following information to the reference indicated:

- [1] Document CCSDS 910.4-B-2, October 2005, is equivalent to ISO 15396:2007.
- [2] Document CCSDS 131.0-B-1, September 2003, is equivalent to ISO 22641:2005.
- [3] Document CCSDS 132.0-B-1, September 2003, is equivalent to ISO 22645:2005.
- [4] Document CCSDS 732.0-B-2, July 2006, is equivalent to ISO 22666:2007.
- [5] Document CCSDS 301.0-B-3, January 2002, is equivalent to ISO 11104:2003.¹⁾
- [7] ISO/IEC 8824-1:2002 has been cancelled and replaced by ISO/IEC 8824-1:2008.

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Add the following information to the reference indicated:

- [E4] Document CCSDS 102.0-B-5-S, November 2000, is equivalent to ISO 13419:2003.
- [E6] Document CCSDS 913.1-B-1, September 2008, is equivalent to ISO 18440:2013.

3 Revision of publication CCSDS 911.2-B-2

It has been agreed with the Consultative Committee for Space Data Systems that Subcommittee ISO/TC 20/SC 13 will be consulted in the event of any revision or amendment of publication CCSDS 911.2-B-2. To this end, NASA will act as a liaison body between CCSDS and ISO.

¹⁾ ISO 11104:2003 has been cancelled and replaced by ISO 11104:2011.

Recommendation for Space Data System Standards

**SPACE LINK EXTENSION—
RETURN CHANNEL
FRAMES SERVICE
SPECIFICATION**

RECOMMENDED STANDARD

CCSDS 911.2-B-2

BLUE BOOK
January 2010

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AUTHORITY

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This document has been approved for publication by the Management Council of the Consultative Committee for Space Data Systems (CCSDS) and represents the consensus technical agreement of the participating CCSDS Member Agencies. The procedure for review and authorization of CCSDS documents is detailed in the *Procedures Manual for the Consultative Committee for Space Data Systems*, and the record of Agency participation in the authorization of this document can be obtained from the CCSDS Secretariat at the address below.

This document is published and maintained by:

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STATEMENT OF INTENT

The Consultative Committee for Space Data Systems (CCSDS) is an organization officially established by the management of its members. The Committee meets periodically to address data systems problems that are common to all participants, and to formulate sound technical solutions to these problems. Inasmuch as participation in the CCSDS is completely voluntary, the results of Committee actions are termed **Recommended Standards** and are not considered binding on any Agency.

This **Recommended Standard** is issued by, and represents the consensus of, the CCSDS members. Endorsement of this **Recommendation** is entirely voluntary. Endorsement, however, indicates the following understandings:

- o Whenever a member establishes a CCSDS-related **standard**, this **standard** will be in accord with the relevant **Recommended Standard**. Establishing such a **standard** does not preclude other provisions which a member may develop.
- o Whenever a member establishes a CCSDS-related **standard**, that member will provide other CCSDS members with the following information:
 - The **standard** itself.
 - The anticipated date of initial operational capability.
 - The anticipated duration of operational service.
- o Specific service arrangements shall be made via memoranda of agreement. Neither this **Recommended Standard** nor any ensuing **standard** is a substitute for a memorandum of agreement.

No later than five years from its date of issuance, this **Recommended Standard** will be reviewed by the CCSDS to determine whether it should: (1) remain in effect without change; (2) be changed to reflect the impact of new technologies, new requirements, or new directions; or (3) be retired or canceled.

In those instances when a new version of a **Recommended Standard** is issued, existing CCSDS-related member standards and implementations are not negated or deemed to be non-CCSDS compatible. It is the responsibility of each member to determine when such standards or implementations are to be modified. Each member is, however, strongly encouraged to direct planning for its new standards and implementations towards the later version of the Recommended Standard.

FOREWORD

Through the process of normal evolution, it is expected that expansion, deletion, or modification of this document may occur. This Recommended Standard is therefore subject to CCSDS document management and change control procedures, which are defined in the *Procedures Manual for the Consultative Committee for Space Data Systems*. Current versions of CCSDS documents are maintained at the CCSDS Web site:

<http://www.ccsds.org/>

Questions relating to the contents or status of this document should be addressed to the CCSDS Secretariat at the address indicated on page i.

At time of publication, the active Member and Observer Agencies of the CCSDS were:

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- Swedish Space Corporation (SSC)/Sweden.

- United States Geological Survey (USGS)/USA.

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DOCUMENT CONTROL

Document	Title	Date	Status
CCSDS 911.2-B-1	Space Link Extension— Return Channel Frames Service Specification	November 2004	Original issue, superseded
CCSDS 911.2-B-2	Space Link Extension—Return Channel Frames Service Specification, Recommended Standard, Issue 2	January 2010	Current issue: – corrects/clarifies/ updates text and adds the option of picosecond resolution to the earth-receive- time parameter.
EC1	Editorial Change 1	August 2010	Corrects editorial errors in A2.4.

NOTE – Substantive changes from the previous issue are indicated by change bars in the inside margin.

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1 INTRODUCTION

1.1 PURPOSE OF THIS RECOMMENDED STANDARD

The purpose of this Recommended Standard is to define the Space Link Extension (SLE) Return Channel Frames (RCF) service in conformance with the SLE Reference Model (reference [1]). The RCF service is an SLE transfer service that delivers to a mission user all telemetry frames from one master channel or one virtual channel.

NOTE – The first issue of reference [1] defines the Return Master Channel Frames (Rtn MC Frames) service and the Return Virtual Channel Frames (Rtn VC Frames) service as two distinct services. Subsequent study has indicated that it is preferable to define one service that provides the functionality of both. The RCF service defined here does just that. It is anticipated that the next issue of reference [1] will take the same approach, deleting the Rtn MC Frames and Rtn VC Frames services and replacing them with the RCF service.

1.2 SCOPE

This Recommended Standard defines, in an abstract manner, the RCF service in terms of:

- a) the operations necessary to provide the service;
- b) the parameter data associated with each operation;
- c) the behaviors that result from the invocation of each operation; and
- d) the relationship between, and the valid sequence of, the operations and resulting behaviors.

It does not specify:

- a) individual implementations or products;
- b) the implementation of entities or interfaces within real systems;
- c) the methods or technologies required to acquire telemetry frames from signals received from a spacecraft;
- d) the methods or technologies required to provide a suitable environment for communications; or
- e) the management activities required to schedule, configure, and control the RCF service.