
**Space data and information transfer
systems — Proximity-1 space link
protocol — Data link layer**

*Systèmes de transfert des informations et données spatiales —
Protocole pour liaisons spatiales de proximité 1 — Couche de liaisons
de données*

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Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

International Standards are drafted in accordance with the rules given in the ISO/IEC Directives, Part 2.

The main task of technical committees is to prepare International Standards. Draft International Standards adopted by the technical committees are circulated to the member bodies for voting. Publication as an International Standard requires approval by at least 75 % of the member bodies casting a vote.

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 22663 was prepared 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 22663:2006), which has been technically revised.

ISO 22663 was prepared by the Consultative Committee for Space Data Systems (CCSDS) (as CCSDS 211.0-B-4, July 2006) 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*.

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Space data and information transfer systems — Proximity-1 space link protocol — Data link layer

1 Scope

This International Standard defines the Proximity-1 space link protocol data link layer (framing, media access, data services, and input-output sublayers). It specifies the protocol data units, framing, media access control, expedited and sequenced controlled data transfer, timing service, i/o control, as well as the procedures for establishing and terminating a session between a caller and responder. The coding and synchronization sublayer is defined in ISO 21459. The physical layer is defined in ISO 21460.

This International Standard does not specify

- a) individual implementations or products;
- b) implementation of service interfaces within real systems;
- c) the methods or technologies required to perform the procedures; or
- d) the management activities required to configure and control the protocol.

The scope and field of application are furthermore detailed in subclause 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 211.0-B-4, July 2006, *Proximity-1 space link protocol — Data link layer*.

For the purposes of international standardization, the modifications outlined below shall apply to the specific clauses and paragraphs of publication CCSDS 211.0-B-4.

Pages i to v

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

Page 1-6

Add the following information to the reference indicated:

- [2] Document CCSDS 232.1-B-1, September 2003, is equivalent to ISO 22667:2005.
- [3] Document CCSDS 232.0-B-1, September 2003, is equivalent to ISO 22664:2005.
- [4] Document CCSDS 132.0-B-1, September 2003, is equivalent to ISO 22645:2005.
- [5] Document CCSDS 131.0-B-1, September 2003, is equivalent to ISO 22641:2005.

Add the following information to the reference indicated:

- [7] Document CCSDS 301.0-B-3, January 2002, is equivalent to ISO 11104:2003.
- [8] Document CCSDS 211.2-B-1, April 2003, is equivalent to ISO 21459:2006.
- [9] Document CCSDS 211.1-B-3, March 2006, is equivalent to ISO 21460:2007.

3 Revision of publication CCSDS 211.0-B-4

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 211.0-B-4. To this end, NASA will act as a liaison body between CCSDS and ISO.

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Recommendation for Space Data System Standards

PROXIMITY-1 SPACE LINK PROTOCOL—

DATA LINK LAYER

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RECOMMENDED STANDARD

CCSDS 211.0-B-4

BLUE BOOK

July 2006

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CCSDS RECOMMENDED STANDARD FOR PROXIMITY-1 SPACE DATA LINK PROTOCOL

AUTHORITY

Issue:	Blue Book, Issue 4
Date:	July 2006
Location:	Washington, DC, USA

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 Recommendations is detailed in *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 Recommendation is published and maintained by:

CCSDS Secretariat
Office of Space Communication (Code M-3)
National Aeronautics and Space Administration
Washington, DC 20546, USA

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STATEMENT OF INTENT

The Consultative Committee for Space Data Systems (CCSDS) is an organization officially established by the management of member space Agencies. 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 **Recommendations** and are not considered binding on any Agency.

This **Recommendation** is issued by, and represents the consensus of, the CCSDS Plenary body. Agency endorsement of this **Recommendation** is entirely voluntary. Endorsement, however, indicates the following understandings:

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

No later than five years from its date of issuance, this **Recommendation** 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 **Recommendation** is issued, existing CCSDS-related Agency standards and implementations are not negated or deemed to be non-CCSDS compatible. It is the responsibility of each Agency to determine when such standards or implementations are to be modified. Each Agency is, however, strongly encouraged to direct planning for its new standards and implementations towards the later version of the Recommendation.

CCSDS RECOMMENDED STANDARD FOR PROXIMITY-1 SPACE DATA LINK PROTOCOL

FOREWORD

Through the process of normal evolution, it is expected that expansion, deletion, or modification of this document may occur. This Recommendation 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.

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

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- Agenzia Spaziale Italiana (ASI)/Italy.
- British National Space Centre (BNSC)/United Kingdom.
- Canadian Space Agency (CSA)/Canada.
- Centre National d'Etudes Spatiales (CNES)/France.
- Deutsches Zentrum für Luft- und Raumfahrt e.V. (DLR)/Germany.
- European Space Agency (ESA)/Europe.
- Federal Space Agency (Roskosmos)/Russian Federation.
- Instituto Nacional de Pesquisas Espaciais (INPE)/Brazil.
- Japan Aerospace Exploration Agency (JAXA)/Japan.
- National Aeronautics and Space Administration (NASA)/USA.

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- Space and Upper Atmosphere Research Commission (SUPARCO)/Pakistan.
- Swedish Space Corporation (SSC)/Sweden.
- United States Geological Survey (USGS)/USA.

CCSDS RECOMMENDED STANDARD FOR PROXIMITY-1 SPACE DATA LINK PROTOCOL

DOCUMENT CONTROL

Document	Title and Issue	Date	Status
CCSDS 211.0-B-1	Proximity-1 Space Link Protocol	October 2002	Superseded
CCSDS 211.0-B-2	Proximity-1 Space Link Protocol— Data Link Layer	April 2003	Superseded
CCSDS 211.0-B-3	Proximity-1 Space Link Protocol— Data Link Layer	May 2004	Superseded
CCSDS 211.0-B-4	Proximity-1 Space Link Protocol— Data Link Layer, Recommended Standard, Issue 4	July 2006	Current Issue: <ul style="list-style-type: none"> – modifies rules for frame selection prioritization, – adds CARRIER ONLY RECEIVED condition to state tables and to annex D Notifications to Vehicle Controller, – clarifies some terminology.

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NOTE – Changes from the previous issue are flagged by change bars in the inside margin.

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