
**Space data and information transfer
systems — Space link extension (SLE)
— Return operational control fields
service specification**

*Systèmes de transfert des données et informations spatiales —
Extension de liaisons spatiales (SLE) — Service des champs de
contrôle de retour opérationnel*

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The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular, the different approval criteria needed for the different types of ISO documents should be noted (see www.iso.org/directives).

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This document was prepared by the Consultative Committee for Space Data Systems (CCSDS) (as CCSDS 911.5-B-3, August 2016) and was adopted (without modifications) by Technical Committee ISO/TC 20, *Space vehicles*, Subcommittee SC 13, *Space data and information transfer systems*.

This third edition cancels and replaces the second edition (ISO 26143:2013), which has been technically revised.

The main changes compared to the previous edition are as follows:

- adds clarifications and corrections;
- adds production status annex.

Any feedback or questions on this document should be directed to the user's national standards body. A complete listing of these bodies can be found at www.iso.org/members.html.

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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 Operational Control Fields (ROCF) service in conformance with the SLE Reference Model (reference [1]). The ROCF service is an SLE transfer service that delivers to a mission user all operational control fields from one master channel or one virtual channel.

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

1.2 SCOPE

This Recommended Standard defines, in an abstract manner, the ROCF 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 ROCF service.

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1.3 APPLICABILITY

1.3.1 APPLICABILITY OF THIS RECOMMENDED STANDARD

This Recommended Standard provides a basis for the development of real systems that implement the ROCF service. Implementation of the ROCF service in a real system additionally requires the availability of a communications service to convey invocations and returns of ROCF service operations between ROCF service users and providers. This Recommended Standard requires that such a communications service must ensure that invocations and returns of operations are transferred:

- a) in sequence;
- b) completely and with integrity;
- c) without duplication;
- d) with flow control that notifies the application layer in the event of congestion; and
- e) with notification to the application layer in the event that communications between the ROCF service user and the ROCF service provider are disrupted, possibly resulting in a loss of data.

It is the specific intent of this Recommended Standard to define the ROCF service in a manner that is independent of any particular communications services, protocols, or technologies.

1.3.2 LIMITS OF APPLICABILITY

This Recommended Standard specifies the ROCF service that may be provided by an SLE Complex for inter-Agency cross support. It is neither a specification of, nor a design for, real systems that may be implemented for the control and monitoring of existing or future missions.

1.4 RATIONALE

The goal of this Recommended Standard is to create a standard for interoperability between the tracking stations or ground data handling systems of various Agencies and the consumers of spacecraft telemetry.

1.5 DOCUMENT STRUCTURE

1.5.1 ORGANIZATION

This document is organized as follows: