



SLOVENSKI STANDARD
SIST EN 16603-50-25:2022

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Nadomešča:

SIST EN 16603-50-04:2015

Vesoljska tehnika - Sprejem obvestila CCSDS 232.0-B-3, protokol vesoljske podatkovne povezave TC

Space engineering - Adoption Notice of CCSDS 232.0-B-3, TC Space Data Link Protocol

Raumfahrttechnik - Adaption CCSDS 232.0-B-3, Telekommando-Weltraum-Datenübertragungsprotokoll

Ingénierie spatiale - Notice d'adoption de la CCSDS 232.0-B-3, TC Space Data Link Protocol

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EUROPEAN STANDARD

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English version

Space engineering - Adoption Notice of CCSDS 232.0-B-3, TC Space Data Link Protocol

Ingénierie spatiale - Notice d'adoption de la CCSDS
232.0-B-3, TC Space Data Link Protocol

Raumfahrttechnik - Adaption CCSDS 232.0-B-3,
Telekommando-Weltraum-
Datenübertragungsprotokoll

This European Standard was approved by CEN on 13 March 2022.

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This European Standard exists in three official versions (English, French, German). A version in any other language made by translation under the responsibility of a CEN and CENELEC member into its own language and notified to the CEN-CENELEC Management Centre has the same status as the official versions.

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European Foreword

This document (EN 16603-50-25:2022) has been prepared by Technical Committee CEN-CENELEC/TC 5 "Space", the secretariat of which is held by DIN.

This standard (EN 16603-50-25:2022) originates from ECSS-E-AS-50-25C.

This European Standard shall be given the status of a national standard, either by publication of an identical text or by endorsement, at the latest by January 2023, and conflicting national standards shall be withdrawn at the latest by January 2023.

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

EN 16603-50-24, EN 16603-50-25 and EN 16603-50-26 together supersede EN16603-50-04:2014.

The main changes with respect to EN16603-50-04:2014 are listed below:

- Replacement of document by three Adoption Notices.

This document has been prepared under a standardization request given to CEN by the European Commission and the European Free Trade Association.

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

According to the CEN-CENELEC Internal Regulations, the national standards organizations of the following countries are bound to implement this European Standard: Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, Former Yugoslav Republic of Macedonia, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Romania, Serbia, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and the United Kingdom.

1 Scope

This document identifies the clauses and requirements modified with respect to the standard CCSDS 232.0-B-3, *TC Space Data Link Protocol*, Issue 3, September 2015 for application in ECSS.

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Context information

In the standard CCSDS 232.0-B-3, *TC Space Data Link Protocol*, CCSDS specifies a data link layer protocol for the efficient transfer of space application data of various types and characteristics over ground-to-space links. The Communications Operation Procedure-1 (COP-1) specified in CCSDS 232.1-B-2 is used with the TC Space Data Link Protocol: it provides a mechanism for delivery of frames in sequence and without gaps or duplication.

This Adoption Notice adopts and applies CCSDS 232.0-B-3 with a minimum set of modifications, identified in the present document, to allow for reference and for a consistent integration in the ECSS system of standards.

The TC Transfer Frame specified in CCSDS 232.0-B-3 is similar to the TC Transfer Frame specified in clauses 5 (Segmentation sublayer) and 6 (Transfer sublayer) in the EN 16603-50-04:2014 (ECSS-E-ST-50-04) *Space data links – Telecommand protocols synchronization and channel coding*.

EN 16603-50-04:2014 (ECSS-E-ST-50-04) is superseded by the following three Adoption Notices: EN 16603-50-24 (ECSS-E-ST-50-24), EN 16603-50-25 (ECSS-E-AS-50-25) and EN 16603-50-26 (ECSS-E-AS-50-26).

Differences between these two standards that are not covered by the normative modifications in clause 4 are described in the informative Annex A.

Overview of superseded EN 16603-50-xx Standards

Superseded EN	New EN	Based on CCSDS
EN 16603-50-01:2014	EN 16603-50-21	CCSDS 131.0-B-3 (Sept. 2017)
EN 16603-50-03:2014	EN 16603-50-22	CCSDS 132.0-B-2 (Sept. 2015)
	EN 16603-50-23	CCSDS 732.0-B-3 (Sept. 2015)
EN 16603-50-04:2014	EN 16603-50-24	CCSDS 231.0-B-3 (Sept. 2017)
	EN 16603-50-25	CCSDS 232.0-B-3 (Sept. 2015)
	EN 16603-50-26	CCSDS 232.1-B-2 (Sept. 2010)

Abbreviated terms

Abbreviation	Meaning
COP	Communications Operation Procedure
FARM	Frame Acceptance and Reporting Mechanism
FDU	Frame Data Unit
GVCID	Global Virtual Channel Identifier
SDLS	Space Data Link Security

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Application requirements

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- a. CCSDS 232.0-B-3, TC Space Data Link Protocol, Issue 3, September 2015 shall apply with the following modifications listed in Table 4-1.

Table 4-1: Applicability table for CCSDS 232.0-B-3

Clause or requirement number	Applicability	Applicable text (the new/added text is underlined)	Comments	Text as in the original document (deleted text with strikethrough)
4.1.1b	Modified	Transfer Frame Data Field (up to 1017 octets, mandatory);	CCSDS requirement modified: number "1019" deleted	Transfer Frame Data Field (up to 1019 or 1017 octets, mandatory);
4.1.1c	Modified	Frame Error Control Field (2 octets, <u>mandatory</u>).	CCSDS requirement modified: word "optional" replaced by the word "mandatory."	Frame Error Control Field (2 octets, optional).
4.1.3.2.1.4	Modified (renumbered NOTE)	<u>NOTE 1</u>	CCSDS existing NOTE is given a new number – the content of the note is unchanged	NOTE

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4.1.3.2.1.4	Modified (new NOTE)	NOTE 2 – If the Packet Assembly Controller Function specified in 4.4.9 is used, there can be Frame Data Units that carry a MAP Reset command. In this case, the Frame Data Unit consists of a Segment Header only and the User Data field is absent. See 4.4.9.4.	New NOTE is added	
4.1.4.1.1	Modified (deleted requirement)	NOTE 1 – The Frame Error Control Field shall be present if the Transfer Frame Data Field is present.	Requirement deleted	The Frame Error Control Field is optional; its presence or absence shall be established by management.
4.1.4.1.2	Modified	<u>The</u> Frame Error Control Field shall occupy the two octets following, without gap, the Transfer Frame Data Field.	CCSDS requirement modified: words “if present” deleted.	If present, the Frame Error Control Field shall occupy the two octets following, without gap, the Transfer Frame Data Field.
4.1.4.1.3	Modified (deleted requirement)	The Frame Error Control Field shall occur within every Transfer Frame transmitted within the same Physical Channel throughout a Mission Phase.	Requirement deleted	If present, the Frame Error Control Field shall occur within every Transfer Frame transmitted within the same Physical Channel throughout a Mission Phase.
Note 2, below 4.1.4.1.3	Modified (deleted NOTE)	NOTE 2 – Whether this field should be used on a particular Physical Channel will be determined based on the mission requirements for data quality and the selected options for the underlying Channel Coding Sublayer.	NOTE deleted	Whether this field should be used on a particular Physical Channel will be determined based on the mission requirements for data quality and the selected options for the underlying Channel Coding Sublayer.

Note 1 in 4.2.1.8.3.1	Modified (modified NOTE)	The No Bit Lock Flag provides a performance quality indicator that indicates specifically whether the Physical Layer is working normally by having enough signal energy to achieve bit synchronization with the received data stream.	CCSDS requirement modified: words “mission specific engineering measurement that” deleted.	The No Bit Lock Flag is an optional, mission specific engineering measurement that provides a performance quality indicator that indicates specifically whether the Physical Layer is working normally by having enough signal energy to achieve bit synchronization with the received data stream.
4.2.1.8.3.2	Modified	<u>The No Bit Lock Flag shall be set as follows: ‘0’ when at least one of the spacecraft demodulation units for the physical channel has achieved bit lock; ‘1’ when none of the spacecraft demodulation units for the physical channel has achieved bit lock.</u>	CCSDS requirement modified to refer to spacecraft demodulation units for the physical channel. Sentences “Use of the No Bit Lock Flag is optional; if used, a) ‘0’ shall indicate bit lock has been achieved; b) ‘1’ shall indicate bit lock has not been achieved.” deleted.	Use of the No Bit Lock Flag is optional; if used, a) ‘0’ shall indicate bit lock has been achieved; b) ‘1’ shall indicate bit lock has not been achieved.
4.2.1.8.3.3	Modified	<u>The No Bit Lock Flag shall always carry an actual report of the status of the physical channel, even when other fields in the CLCW report the status of an inactive virtual channel.</u>	CCSDS requirement modified to refer to actual report of the status of the physical channel. Sentense “The single No Bit Lock Flag shall apply to all Virtual Channels and shall be updated whenever a change is signaled by the Physical Layer”. deleted.	The single No Bit Lock Flag shall apply to all Virtual Channels and shall be updated whenever a change is signaled by the Physical Layer.
4.2.1.8.3.4	Modified (deleted requirement)		Requirement deleted	If the No Bit Lock Flag is not used, it shall be set permanently to ‘0’.