



SLOVENSKI STANDARD
oSIST prEN 16603-50-21:2021
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Vesoljska tehnika - Sprejem obvestila CCSDS 131.0-B-3, sinhronizacija TM in kodiranje kanalov, številka 3, september 2017

Space engineering - Adoption Notice of CCSDS 131.0-B-3, TM Synchronization and Channel Coding, Issue 3, September 2017

Raumfahrttechnik - Adoption Notice von CCSDS 131.0-B-3, TM-Synchronisation und Kanalcodierung, Ausgabe 3, September 2017

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EUROPEAN STANDARD
NORME EUROPÉENNE
EUROPÄISCHE NORM

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prEN 16603-50-21

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English version

**Space engineering - Adoption Notice of CCSDS 131.0-B-3,
TM Synchronization and Channel Coding, Issue 3,
September 2017**

Raumfahrttechnik - Adoption Notice von CCSDS 131.0-B-3, TM-Synchronisation und Kanalcodierung, Ausgabe 3, September 2017

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

This draft European Standard was established by CEN and CENELEC 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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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

This document (prEN 16603-50-21:2021) has been prepared by Technical Committee CEN/CLC/TC 5 "Space", the secretariat of which is held by DIN (Germany).

This document (prEN 16603-50-21:2021) originates from ECSS-E-AS-50-21C-DIR1.

This document is currently submitted to the ENQUIRY.

This document will supersede EN 16603-50-01:2014.

The main changes with respect to EN 16603-50-01:2014 are listed below:

- Replacement of the Standard by an Adoption Notice.

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 do-main of applicability (e.g. : aerospace).

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1 Scope

This document identifies the clauses and requirements modified with respect to the standard CCSDS 131.0-B-3, *TM Synchronization and Channel Coding*, Issue 3, September 2017 for application in ECSS.

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Context information

The standard CCSDS 131.0-B-3, *TM Synchronization and Channel Coding*, has been developed by CCSDS for use in developing synchronization and channel coding systems.

With this Adoption Notice ECSS is adopting and applying CCSDS 131.0-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.

CCSDS 131.0-B-3 is similar to the EN 16603-50-01 (based on ECSS-E-ST-50-01) *Space data links - Telemetry synchronization and channel codin.*

EN 16603-50-01 (based on ECSS-E-ST-50-01) is superseded by EN 16603-50-21 (based on ECSS-E-AS-50-21).

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

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 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 (August 2016)
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
PSK	phase-shift keying
4D-8PSK-TCM	4-dimensional 8PSK trellis-coded modulation

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Application requirements

- a. CCSDS 131.0-B-3, TM Synchronization and Channel Coding, Issue 3, September 2017 shall apply as written with the following modifications listed in Table 4-1.

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Table 4-1: Applicability table for CCSDS 131.0-B-2

Clause or requirement number	Applicability	Applicable text (the new/added text is underlined)	Comments	Text as in the original document (deleted text with strikethrough)
3.2.4	Modified	Soft bit decisions with at least three-bit quantization <u>shall be used for the decoder.</u>	CCSDS requirement modified: for convolutional codes. Words “should be used whenever constraints (such as complexity of decoder) permit” deleted and replaced by words “shall be used for the decoder”	Soft bit decisions with at least three-bit quantization should be used whenever constraints (such as complexity of decoder) permit.
4.3.1c.	New requirement	E=8 shall not be used unless the modulation scheme is 4-dimensional 8PSK trellis-coded modulation (4D-8PSK-TCM).	New requirement added: restricted use of Reed-Solomon codes with E=8	

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Clause or requirement number	Applicability	Applicable text (the new/added text is underlined)	Comments	Text as in the original document (deleted text with strikethrough)
4.3.5.1	Modified	The allowable values of interleaving depth shall be: a) When E=16, I=1, 2, 3, 4, 5, and 8. b) When E=8, I=8	CCSDS requirement modified for Reed-Solomon codes to explain better applicability of E=16 and E=8	The allowable values of interleaving depth are I=1, 2, 3, 4, 5, and 8.
4.3.5.2	Modified	The interleaving depth shall be fixed on a Physical Channel for a Mission Phase.	CCSDS requirement modified for Reed-Solomon codes: word "normally" deleted.	The interleaving depth shall normally be fixed on a Physical Channel for a Mission Phase.
5.1	Modified	Concatenated codes shall consist of a combination of a Reed-Solomon code with <u>E=16</u> defined in section 4 with one of the convolutional codes defined in section 3.	CCSDS requirement modified for restricted use of Reed-Solomon codes: the original requirement was applicable to both E=8 and E=16, the new requirement applies only to E=16	Concatenated codes shall consist of a combination of a Reed-Solomon code defined in section 4 with one of the convolutional codes defined in section 3.
5.1	New NOTE	NOTE - Reed-Solomon code with E=8 is not concatenated with one of the convolutional codes.	New NOTE added.	