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Space engineering - Interface and communication protocol for MIL-STD-1553B data bus onboard spacecraft

Táto norma obsahuje anglickú verziu európskej normy.
This standard includes the English version of the European Standard.

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English version

Space engineering - Interface and communication protocol for MIL-STD-1553B data bus onboard spacecraft

Ingénierie spatiale - Interface et protocole de communication pour de bus de données embarqué MIL-STD 1553B

Raumfahrttechnik - Schnittstellen und Kommunikationsprotokoll für MIL-STD-1553B Datenbusse in Raumfahrzeugen

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Foreword

This document (EN 16603-50-13:2014) has been prepared by Technical Committee CEN/CLC/TC 5 “Space”, the secretariat of which is held by DIN.

This standard (EN 16603-50-13:2014) originates from ECSS-E-ST-50-13C.

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of an identical text or by endorsement, at the latest by March 2015, and conflicting national standards shall be withdrawn at the latest by March 2015.

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This document has been prepared under a mandate 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).

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Scope

Using standard communication protocols for spacecraft communication links can provide interface compatibility between communication devices and components. Thus, it can improve the design and development process as well as integration and test activities at all levels, and provide the potential of reusability across projects.

The aim of this space engineering standard is to define the interface services and to specify their corresponding bus protocol elements for spacecraft using the MIL-STD-1553B data bus. It also aims at defining requirements for harmonisation of physical interface and usage of the MIL-STD-1553B data link layer features.

Another goal of this standard is to facilitate the bus profiling task by proposing a message scheduling scheme to the mission system architects. Such framework helps to homogenise the allocation and control of communication resources across a single project or spacecraft mission.

The scope of this standard is as follows:

- It details the usage of the MIL-STD-1553B.
- It covers the communication protocols, services and functions needed for exchange of information over MIL-STD-1553B data bus.
- It is limited to necessary and sufficient requirements to ensure compatibility for communication through MIL-STD-1553B data bus for communication devices onboard a spacecraft and across projects.
- It covers a wide spectrum of mission needs.
- It does not modify requirements that are under the scope of MIL-STD-1553B.
- It covers recommendation for verification and test of communication devices communicating through a MIL-STD-1553 data bus.

This Standard provides a comprehensive set of requirements for all communication devices and components onboard a spacecraft, which are connected to a single (redundant) data bus according to MIL-STD-1553B.

Although the standard focuses on the specification of single-bus architecture, questions related to multiple-bus-architectures or the use of repeaters for separable busses (for launchers) are also addressed.

This Standard aims at specifying requirements that are technically feasible, correct, consistent and compliant with the needs and overall technological approach and industrial policies of the participating Agencies and Industry.

This standard may be tailored for the specific characteristic and constrains of a space project in conformance with ECSS-S-ST-00.

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Normative references

The following normative documents contain provisions which, through reference in this text, constitute provisions of this ECSS Standard. For dated references, subsequent amendments to, or revision of any of these publications do not apply, However, parties to agreements based on this ECSS Standard are encouraged to investigate the possibility of applying the more recent editions of the normative documents indicated below. For undated references, the latest edition of the publication referred to applies.

EN reference	Reference in text	Title
EN 16601-00-01	ECSS-S-ST-00-01	ECSS System - Glossary of terms.
	MIL-STD-1553B	Interface Standard for Digital Time Division Command/Response Multiplex Data Bus, Notice 2, 8th September 1986 Notice 3, 31st January 1993 Notice 4, 15th January 1996
	MIL-HDBK-1553A	Military handbook. Multiplex applications handbook, 1st November 1988

NOTE The technical requirements and their numbering are identical in Notices 2, 3 and 4 of the MIL-STD-1553B standard. Therefore, ECSS-E-ST-50-13 can be used in complement to any of those MIL-STD-1553B standard notices.