

STN	Kozmická technika SpaceWire Linky, uzly, smerovače a siete	STN EN 16603-50-12 31 0543
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Space engineering - SpaceWire - Links, nodes, routers and networks

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

Táto norma bola oznámená vo Vestníku ÚNMS SR č. 08/20

Obsahuje: EN 16603-50-12:2020

131138

EUROPEAN STANDARD

EN 16603-50-12

NORME EUROPÉENNE

EUROPÄISCHE NORM

March 2020

ICS 49.140

English version

Space engineering - SpaceWire - Links, nodes, routers and networks

Ingénierie spatiale - SpaceWire - Liaisons, noeuds,
routeurs et réseaux

Raumfahrttechnik - SpaceWire - Verbindungen,
Knoten, Router und Netzwerke

This European Standard was approved by CEN on 29 December 2019.

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Rue de la Science 23, B-1040 Brussels**

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European Foreword

This document (EN 16603-50-12:2020) has been prepared by Technical Committee CEN-CENELEC/TC 5 "Space", the secretariat of which is held by DIN.

This standard (EN 16603-50-12:2020) originates from ECSS-E-ST-50-12C Rev.1.

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of an identical text or by endorsement, at the latest by September 2020, and conflicting national standards shall be withdrawn at the latest by September 2020.

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

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

SpaceWire technology has grown from the needs of spacecraft on-board data handling applications. This Standard provides a formal basis for the exploitation of SpaceWire in a wide range of future on-board processing systems.

One of the principal aims of SpaceWire is the support of equipment compatibility and reuse at both the component and subsystem levels. In principle a data-handling system developed for an optical instrument, for example, can be used for a radar instrument by unplugging the optical sensor and plugging in the radar one. Processing units, mass-memory units and down-link telemetry systems developed for one mission can be readily used on another mission, reducing the cost of development, improving reliability and most importantly increasing the amount of scientific work that can be achieved within a limited budget.

Integration and test of complex on-board systems is also supported by SpaceWire with ground support equipment plugging directly into the on-board data-handling system. Monitoring and testing can be carried out with a seamless interface into the on-board system.

SpaceWire is the result of the efforts of many individuals within the European Space Agency, European Space Industry and academia.

This standard may be tailored for the specific characteristics and constraints 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
EN 16602-70-08	ECSS-Q-ST-70-08	Space product assurance - Manual soldering of high-reliability electrical connections
EN 16602-70-26	ECSS-Q-ST-70-26	Space product assurance - Crimping of high-reliability electrical connections
	ESCC 3401	Connectors, electrical, non-filtered circular and rectangular, ESCC Generic Specification no. 3401, Issue 5, March 2018
	ESCC 3401/029:2017	Connectors, Electrical, Rectangular, Microminiature, based on type MDMA, ECSS Detail Specification no. 3401/029, Issue 15, November 2017.
	ESCC 3401/077:2016	Connectors, Electrical, Rectangular, Microminiature, Removable Crimp Contacts, based on type MDMA, ECSS Detail Specification no. 3401/077, Issue 7, April 2016.
	ESCC 3902/003:2014	Cable, "SpaceWire", Round, Quad using Symmetric Cables, Flexible, -200 to +180 °C, Detail Specification no. 3902/003, Issue 4, November 2014.
	ESCC 3902/004:2014	Cable, Low Mass, "SpaceWire", Round, Quad using Symmetric Cables, Flexible, -100 to +150 °C, Detail Specification no. 3902/004, Issue 1, October 2014.
	MIL-DTL-17J:2014	Military Specification: Cables, Radio, Frequency, Flexible and Semirigid, General Specification for, 10 th February 2014.
	TIA-644-A:2012	TIA-644-A, Electrical Characteristics of Low Voltage Differential Signalling (LVDS) Interface Circuits, Revision A, Reaffirmed 12/07/12, Telecommunications Industry Association, 2012.