

SMPTE STANDARD

3 Gb/s Signal/Data
Serial Interface



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Foreword

SMPTE (the Society of Motion Picture and Television Engineers) is an internationally-recognized standards developing organization. Headquartered and incorporated in the United States of America, SMPTE has members in over 80 countries on six continents. SMPTE's Engineering Documents, including Standards, Recommended Practices, and Engineering Guidelines, are prepared by SMPTE's Technology Committees. Participation in these Committees is open to all with a bona fide interest in their work. SMPTE cooperates closely with other standards-developing organizations, including ISO, IEC and ITU.

SMPTE Engineering Documents are drafted in accordance with the rules given in Part XIII of its Operations Manual.

SMPTE ST 424 was prepared by Technology Committee 32NF.

Intellectual Property

At the time of publication no notice had been received by SMPTE claiming patent rights essential to the implementation of this Standard. However, attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. SMPTE shall not be held responsible for identifying any or all such patent rights.

Introduction

This section is entirely informative and does not form an integral part of this Engineering Document.

This standard defines a bit-serial data interface for the transport of 3 Gb/s [nominal] component digital signals or packetized data. The SMPTE ST 425 set of standards define the mapping of various source image formats to the bit-serial data structure defined here in this document. SMPTE 425-0 contains an informative roadmap for 3 Gb/s Signal/Data Serial Interfaces.

1 Scope

This standard defines a bit-serial data structure and coaxial cable interface for the transport of signals with a total payload of 2.970 Gb/s or 2.970/1.001 Gb/s.

This standard specifies the electrical and physical characteristics of a coaxial cable interface suitable for applications where the signal loss does not exceed an amount specified by the receiver manufacturer. Typical loss amounts would be in the range of up to 30 dB at one-half the clock frequency.

2 Conformance Notation

Normative text is text that describes elements of the design that are indispensable or contains the conformance language keywords: "shall", "should", or "may". Informative text is text that is potentially helpful to the user, but not indispensable, and can be removed, changed, or added editorially without affecting interoperability. Informative text does not contain any conformance keywords.

All text in this document is, by default, normative, except: the Introduction, any section explicitly labeled as "Informative" or individual paragraphs that start with "Note:"

The keywords "shall" and "shall not" indicate requirements strictly to be followed in order to conform to the document and from which no deviation is permitted.

The keywords, "should" and "should not" indicate that, among several possibilities, one is recommended as particularly suitable, without mentioning or excluding others; or that a certain course of action is preferred but not necessarily required; or that (in the negative form) a certain possibility or course of action is deprecated but not prohibited.

The keywords "may" and "need not" indicate courses of action permissible within the limits of the document.

The keyword "reserved" indicates a provision that is not defined at this time, shall not be used, and may be defined in the future. The keyword "forbidden" indicates "reserved" and in addition indicates that the provision will never be defined in the future.

A conformant implementation according to this document is one that includes all mandatory provisions ("shall") and, if implemented, all recommended provisions ("should") as described. A conformant implementation need not implement optional provisions ("may") and need not implement them as described.

Unless otherwise specified, the order of precedence of the types of normative information in this document shall be as follows: Normative prose shall be the authoritative definition; Tables shall be next; followed by formal languages; then figures; and then any other language forms.

3 Normative References

The following standards contain provisions that, through reference in this text, constitute provisions of this standard. At the time of publication, the editions indicated were valid. All standards are subject to revision, and parties to agreements based on this standard are encouraged to investigate the possibility of applying the most recent edition of the standards indicated below.

SMPTE ST 425-1:2011, Source Image Format and Ancillary Data Mapping for the 3Gb/s Serial Interface

SMPTE RP 184:2004, Specification of Jitter in Bit Serial Digital Systems

IEC 61169-8 (2007-2), Part 8: Sectional Specification — R.F. Coaxial Connectors with Inner Diameter of Outer Conductor 6,5 mm (0,256 in) with Bayonet Lock — Characteristic Impedance 50Ω (Type BNC), Annex

A (Normative) Information for Interface Dimensions of 75Ω Characteristic Impedance Connector with Unspecified Reflection Factor¹

4 Source Data

For this interface, the source data shall be a virtual interface consisting of two 10-bit parallel data streams — data stream one and data stream two.

The virtual interface shall be constructed in accordance with SMPTE ST 425-1.

Data for each line of data stream one and data stream two of the virtual interface are divided into four areas: EAV (end of active line) timing reference plus LN and CRC data words; the blanking area optionally containing ancillary data; SAV (start of active video) timing reference; and the digital active line as shown in Figure 1.

5 Parallel Data Format

The 10-bit data words of parallel data stream one and data stream two of the virtual interface, are shown in Figure 1.

By way of example, Figure 1 illustrates the mapping of SMPTE ST 274 4:2:2 (Y'C'B'C'R)/10-bit signals at 60 or 60/1.001 frame rates.

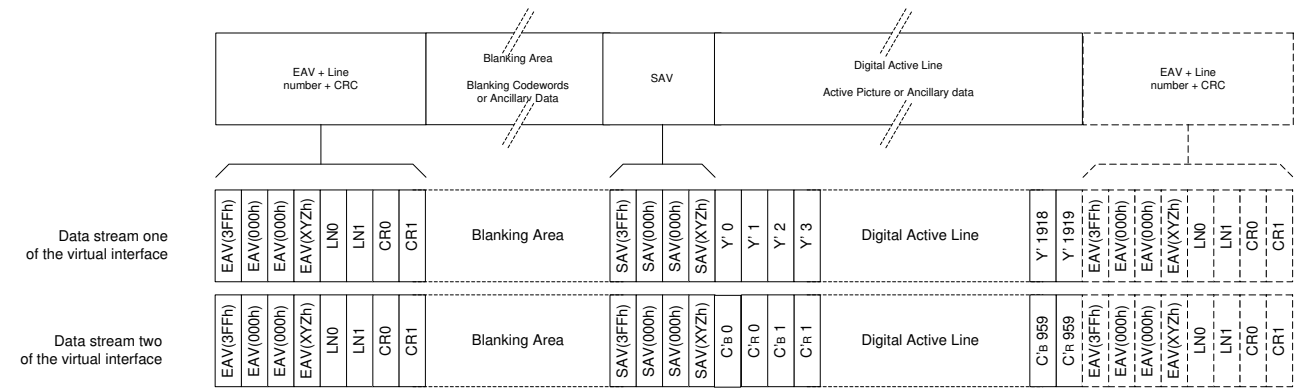


Figure 1 – Example parallel data format for data stream one and data stream two of the virtual interface

6 Serial Data Format

The two parallel data streams of the virtual interface are transmitted over a single channel in bit-serial form after word-multiplexing, parallel-to-serial conversion and scrambling have been applied.

Data stream one and data stream two of the virtual interface shall be multiplexed word-by-word into a single 10-bit parallel stream in the order: data stream two; data stream one; data stream two.....etc, as shown in Figure 2.

¹ Please note that the title of this normative reference may be misleading. This standard requires the use of the 75 ohm connector defined in Annex A of this reference.