

SMPTE STANDARD

12 Gb/s Signal/Data Serial Interface — Electrical



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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 its Standards Operation Manual.

SMPTE ST 2082-1 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.

SMPTE ST 2082-1 defines a bit-serial data interface for the transport of 12 Gb/s [nominal] component digital signals or packetized data. The mapping of various source image formats to the bit-serial data structure defined here in this document are described in additional SMPTE ST 2082 document parts.

SMPTE ST 2082-0 contains an informative roadmap for the 12 Gb/s Signal/Data Serial Interfaces.

End users are cautioned that they should work with Serial Digital Interface equipment vendors to ensure the electrical and mechanical capabilities of cables and connectors — whether existing or new — in support of this interface meet their requirements.

1 Scope

This standard describes the electrical and physical characteristics of a 12G-SDI 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 40 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 2082-10:2015, 2160-line and 1080-line Source Image and Ancillary Data Mapping for 12G-SDI

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

IEC 61169-8 (2007-2), Radio-Frequency Connectors — 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 50 Ω (Type BNC), Annex A (Normative) Information for Interface Dimensions of 75 Ω Characteristic Impedance Connector with Unspecified Reflection Factor^{1,2},

IEC 61169-29 (2005-6), Radio-Frequency Connectors — Part 29: Sectional Specification — Miniature Radio Frequency Coaxial Connectors Model Screw, Snap-on, Push-pull or Quick-lock, Slide-in (Rack and Panel Applications) — Characteristic Impedance 50 Ω (Type 1,0/2,3) – 50 Ω and 75 Ω Applications²

4 Source Data

For this interface, the source data shall be the 12G-SDI 10-bit Multiplex as defined for example in SMPTE ST 2082-10, of the form illustrated in the diagram of Figure 1 and Figure 2, having an interface frequency of 1188 MHz or 1188/1.001 MHz.

Note:

Figure 1 shows the Type 1 10-bit multiplex resulting from mapping modes in which each data stream has a single instance of TRS words, Line Numbers, CRC Words, etc.

Figure 2 shows the Type 2 10-bit multiplex resulting from mapping modes in which each data stream has two instances of TRS words, Line Numbers, CRC Words, etc. A type 2 multiplex is the result of SMPTE ST 292-1 mapping of each sub image. It is generated for 4:2:2 10-bit formats with frame rates of 30fps or less.

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

² Please note that this reference is required ONLY to provide mechanical dimensions of 75 ohm connectors.

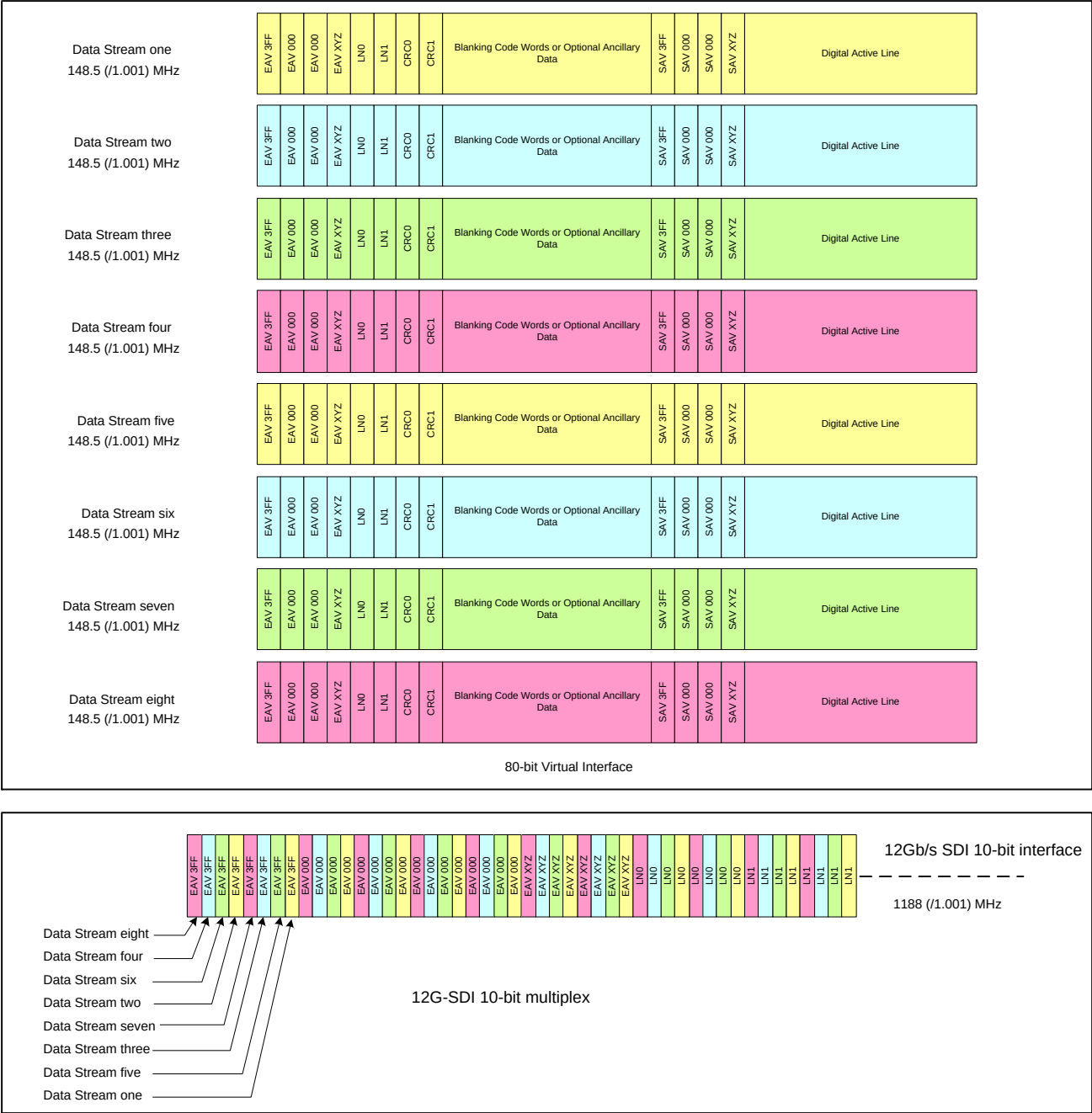


Figure 1 – 12G-SDI 10-bit Multiplex – Type 1