

SMPTE STANDARD

D-Cinema Distribution Master —
Image Pixel Structure Level 3 —
Serial Digital Interface Signal Formatting



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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.

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SMPTE Standard 428-9 was prepared by Technology Committee DC28.

1 Scope

This standard defines the formatting and constraints of the DCDM SMPTE 428-1 Level 3 image Pixel Structure for transmission over the 1.485Gb/s dual link serial digital interface SMPTE 372M or 3Gb/s interface SMPTE 424M. The Serial Digital Interface (SDI) container parameters for DCDM level 3 are given in Table 1.

Table 1 – SDI container pixel array

DCDM level	System nomenclature	X' Y' Z' samples per active line (S/AL)	Lines per container (AL/F)	Frame rate (Hz)	Interface sampling frequency fs (MHz)	X' Y' Z' sample periods per total line (S/TL)	Interface total lines per frame
3	2048 × 1080/24/P	2048	1080	24	74.25	2750	1125

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.

3 Normative References

The following standards contain provisions which, 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 291M-2006, Television — Ancillary Data Packet and Space Formatting

SMPTE 428-1-2006, D-Cinema Distribution Master (DCDM) — Image Characteristics

4 SDI Image Data Format Constraints

4.1 The serial digital container is a fixed container size with a 2048x1080 pixel array . See Figure 1.

4.2 Within the serial digital container not all pixels will form the image as defined by SMPTE 428-1, these pixels shall be called padding pixels and have a value of 010_h. The center of the DCDM Image pixel array shall correspond to the center of the SDI container.

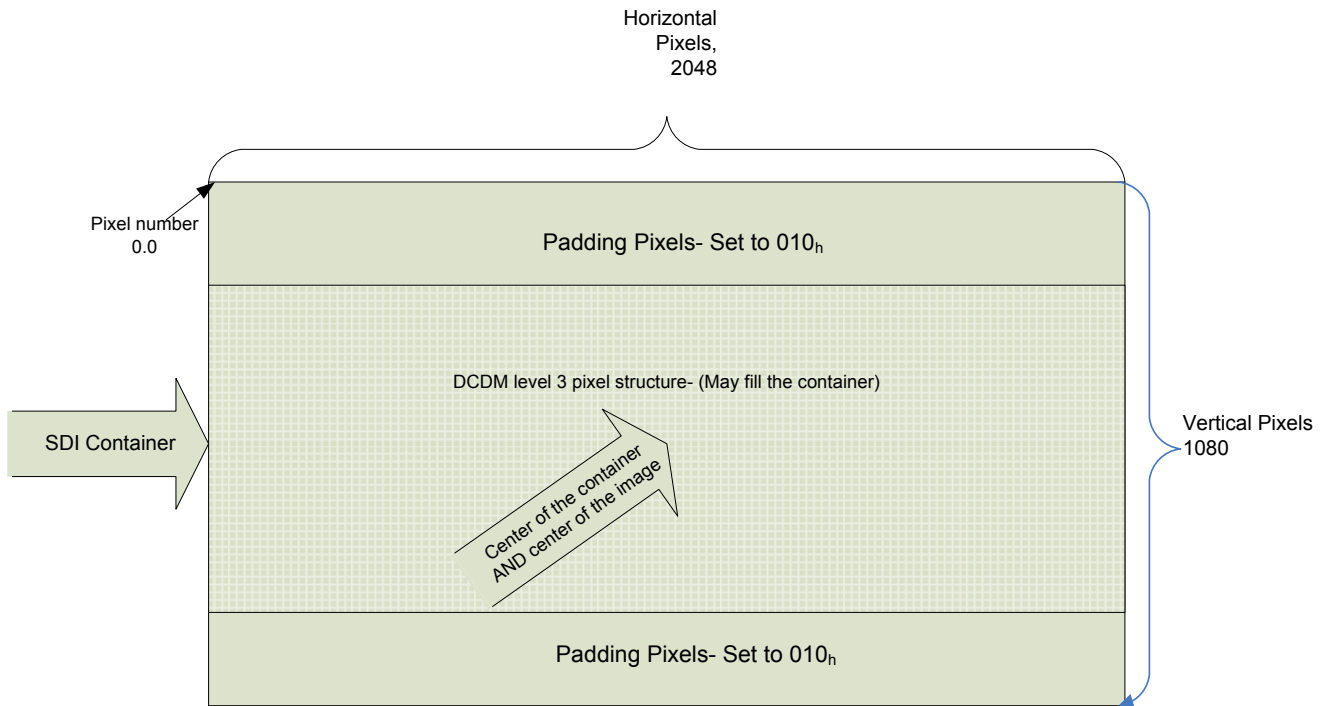


Figure 1 – Serial digital container

4.3 The DCDM level 3 pixel image structure shall employ X' , Y' , Z' coding as defined in DCDM image pixel structure format, SMPTE 428-1,

4.4 X' Y' Z' code values shall be contained within the range of $FEF_h - 010_h$. Values that may exist in the source signal, beyond these defined limits shall be clipped.

4.5 Code values $FF0_h - FFF_h$ and $000_h - 00F_h$ are prohibited in the payload.