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## S T A N D A R D S

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**Data Standards Subcommittee**

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**SCTE STANDARD**

**SCTE 262-1 2020**

**DOCSIS 4.0 Part 1: Physical Layer Specification**

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## 1. Introduction

### 1.1. Executive Summary

The present document provides the SCTE endorsement of CableLabs specification: CM-SP-PHYv4.0-I02-200429.

### 1.2. Scope

This generation of the DOCSIS®<sup>1</sup> specifications builds upon the previous generations of DOCSIS specifications (commonly referred to as the DOCSIS 3.1 and earlier specifications), leveraging the existing Media Access Control (MAC) and Physical (PHY) layers. It includes backward compatibility for the existing PHY layers in order to enable a seamless migration to the new technology. Further, the DOCSIS 4.0 specifications introduces Full Duplex (FDX) DOCSIS PHY layer technology as an expansion of the OFDM PHY layer introduced in the DOCSIS 3.1 PHY specification to increase upstream capacity without significant loss of downstream capacity versus DOCSIS 3.1. The DOCSIS 4.0 specification also builds upon DOCSIS 3.1 OFDM and OFDMA technology with an extended Frequency Division Duplex (FDD) DOCSIS alternative. DOCSIS 4.0 FDD supports legacy high split and also provides extended splits up to 684 MHz in an operational band plan which is referred to as Ultra-high Split (UHS). DOCSIS 4.0 FDD also introduces expansion of usable downstream spectrum up to 1794 MHz. Both the FDX and FDD DOCSIS 4.0 alternatives are based on OFDM PHY. Many sections refer to basic OFDM sublayer definitions described in [DOCSIS PHYv3.1].

There are differences in the cable spectrum planning practices adopted for different networks in the world. For the PHY layer defined in this specification, there is flexibility to deploy the technology in any spectrum plan; therefore, no special accommodation for different regions of the world is required for this new PHY layer.

However, due to the inclusion of the DOCSIS 3.0 PHY layers for backward-compatibility purposes, there is still a need for different region-specific physical layer technologies. Therefore, three options for physical layer technologies are included in this specification, which have equal priority and are not required to be interoperable. One technology option is based on the downstream channel identification plan that is deployed in North America using 6 MHz spacing. The second technology option is based on the corresponding European multi-program television distribution. The third technology option is based on the corresponding Chinese multi-program television distribution. All three options have the same status, notwithstanding that the document structure does not reflect this equal priority. The first of these options is defined in Sections 5 and 6, whereas the second is defined by replacing the content of those sections with the content of Annex C of [DOCSIS PHYv3.1]. The third is defined by replacing the content of those sections with the content of Annex D of [DOCSIS PHYv3.1]. Correspondingly, [ITU-T J.83-B] and [CTA 542] apply only to the first option, and [EN 300 429] applies to the second and third. Compliance with this document requires compliance with one of these implementations, but not with all three. It is not required that equipment built to one option interoperate with equipment built to the others.

Compliance with frequency planning and EMC requirements is not covered by this specification and remains the operators' responsibility. In this respect, [FCC15] and [FCC76] are relevant to the USA; [CAN/CSA CISPR 22-10] and [ICES 003 Class A] to Canada; [EG 201 212], [EN 50083-1], [EN 50083-2], [EN 50083-7], [EN 61000-6-1], and [EN 61000-6-3] are relevant to the European Union; [GB 8898-2011] and [GB/T 11318.1-1996] are relevant to China.

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<sup>1</sup> DOCSIS® is a registered trademark of Cable Television Laboratories, Inc

See also [DOCSIS PHYv3.1] section 1.1.

## **2. Normative References**

The following documents contain provisions, which, through reference in this text, constitute provisions of this document. At the time of Subcommittee approval, the editions indicated were valid. All documents are subject to revision; and while parties to any agreement based on this document are encouraged to investigate the possibility of applying the most recent editions of the documents listed below, they are reminded that newer editions of those documents might not be compatible with the referenced version.

### **2.1. SCTE References**

- No normative references are applicable.

### **2.2. Standards from Other Organizations**

[1] Physical Layer Specification, CM-SP-PHYv4.0-I02-200429, April 29, 2019, Cable Television Laboratories, Inc. [www.cablelabs.com](http://www.cablelabs.com)

### **2.3. Published Materials**

- No normative references are applicable.

## **3. Informative References**

The following documents might provide valuable information to the reader but are not required when complying with this document.

### **3.1. SCTE References**

- No informative references are applicable.

### **3.2. Standards from Other Organizations**

- No informative references are applicable.

### **3.3. Published Materials**

- No informative references are applicable.

## 4. Compliance Notation

<i>shall</i>	This word or the adjective “ <b>required</b> ” means that the item is an absolute requirement of this document.
<i>shall not</i>	This phrase means that the item is an absolute prohibition of this document.
<i>forbidden</i>	This word means the value specified shall never be used.
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<i>deprecated</i>	Use is permissible for legacy purposes only. Deprecated features may be removed from future versions of this document. Implementations should avoid use of deprecated features.

## 5. Abbreviations and Definitions

### 5.1. Abbreviations

For the purposes of the present document, the abbreviations given in CableLabs specification: CM-SP-PHYv4.0-I02-200429, [1] apply.

### 5.2. Definitions

For the purposes of the present document, the abbreviations given in CableLabs specification: CM-SP-PHYv4.0-I02-200429 [1] apply.

## 6. Endorsement Notice

All elements of CableLabs specification: CM-SP-PHYv4.0-I02-200429 [1] **shall** apply without modifications.