

PD IEC/TS 62644:2012



BSI Standards Publication

Professional video storage equipment — Guideline of time code transmission

NO COPYING WITHOUT BSI PERMISSION EXCEPT AS PERMITTED BY COPYRIGHT LAW

raising standards worldwide™



National foreword

This Published Document is the UK implementation of IEC/TS 62644:2012.

The UK participation in its preparation was entrusted to Technical Committee EPL/100, Audio, video and multimedia systems and equipment.

A list of organizations represented on this committee can be obtained on request to its secretary.

This publication does not purport to include all the necessary provisions of a contract. Users are responsible for its correct application.

© The British Standards Institution 2013

Published by BSI Standards Limited 2013

ISBN 978 0 580 79773 6

ICS 33.160.40

Compliance with a British Standard cannot confer immunity from legal obligations.

This Published Document was published under the authority of the Standards Policy and Strategy Committee on 31 May 2013.

Amendments issued since publication

Amd. No.	Date	Text affected
-----------------	-------------	----------------------



TECHNICAL SPECIFICATION

Professional video storage equipment – Guideline of time code transmission

INTERNATIONAL
ELECTROTECHNICAL
COMMISSION

PRICE CODE

K

ICS 33.160.40

ISBN 978-2-83220-414-6

Warning! Make sure that you obtained this publication from an authorized distributor.

CONTENTS

FOREWORD.....	3
INTRODUCTION.....	5
1 Scope.....	6
2 Normative references	6
3 Terms and definitions	6
4 Transmission of time code.....	7
4.1 Time address of a frame pair in progressive systems	7
4.2 Relationship between frame pair and ATC.....	7
4.3 Relationship between the reference signal and ATC.....	8
Bibliography.....	10
Figure 1 – Time address of frame pair	7
Figure 2 – Relationship between reference signal and ATC	8
Figure 3 – Example of relationship between reference signal and ATC (1/2 speed play)	9

INTERNATIONAL ELECTROTECHNICAL COMMISSION

PROFESSIONAL VIDEO STORAGE EQUIPMENT – GUIDELINE OF TIME CODE TRANSMISSION

FOREWORD

- 1) The International Electrotechnical Commission (IEC) is a worldwide organization for standardization comprising all national electrotechnical committees (IEC National Committees). The object of IEC is to promote international co-operation on all questions concerning standardization in the electrical and electronic fields. To this end and in addition to other activities, IEC publishes International Standards, Technical Specifications, Technical Reports, Publicly Available Specifications (PAS) and Guides (hereafter referred to as "IEC Publication(s)"). Their preparation is entrusted to technical committees; any IEC National Committee interested in the subject dealt with may participate in this preparatory work. International, governmental and non-governmental organizations liaising with the IEC also participate in this preparation. IEC collaborates closely with the International Organization for Standardization (ISO) in accordance with conditions determined by agreement between the two organizations.
- 2) The formal decisions or agreements of IEC on technical matters express, as nearly as possible, an international consensus of opinion on the relevant subjects since each technical committee has representation from all interested IEC National Committees.
- 3) IEC Publications have the form of recommendations for international use and are accepted by IEC National Committees in that sense. While all reasonable efforts are made to ensure that the technical content of IEC Publications is accurate, IEC cannot be held responsible for the way in which they are used or for any misinterpretation by any end user.
- 4) In order to promote international uniformity, IEC National Committees undertake to apply IEC Publications transparently to the maximum extent possible in their national and regional publications. Any divergence between any IEC Publication and the corresponding national or regional publication shall be clearly indicated in the latter.
- 5) IEC itself does not provide any attestation of conformity. Independent certification bodies provide conformity assessment services and, in some areas, access to IEC marks of conformity. IEC is not responsible for any services carried out by independent certification bodies.
- 6) All users should ensure that they have the latest edition of this publication.
- 7) No liability shall attach to IEC or its directors, employees, servants or agents including individual experts and members of its technical committees and IEC National Committees for any personal injury, property damage or other damage of any nature whatsoever, whether direct or indirect, or for costs (including legal fees) and expenses arising out of the publication, use of, or reliance upon, this IEC Publication or any other IEC Publications.
- 8) Attention is drawn to the Normative references cited in this publication. Use of the referenced publications is indispensable for the correct application of this publication.
- 9) Attention is drawn to the possibility that some of the elements of this IEC Publication may be the subject of patent rights. IEC shall not be held responsible for identifying any or all such patent rights.

The main task of IEC technical committees is to prepare International Standards. In exceptional circumstances, a technical committee may propose the publication of a technical specification when

- the required support cannot be obtained for the publication of an International Standard, despite repeated efforts, or
- the subject is still under technical development or where, for any other reason, there is the future but no immediate possibility of an agreement on an International Standard.

Technical specifications are subject to review within three years of publication to decide whether they can be transformed into International Standards.

IEC 62644, which is a technical specification, has been prepared by technical area 6: Storage media, data structures, equipment and systems, of IEC technical committee 100: Audio, video and multimedia systems and equipment.

The text of this technical specification is based on the following documents:

Enquiry draft	Report on voting
100/1968/DTS	100/2022/RVC

Full information on the voting for the approval of this technical specification can be found in the report on voting indicated in the above table.

This publication has been drafted in accordance with the ISO/IEC Directives, Part 2.

The committee has decided that the contents of this publication will remain unchanged until the stability date indicated on the IEC web site under "<http://webstore.iec.ch>" in the data related to the specific publication. At this date, the publication will be

- transformed into an International Standard,
- reconfirmed,
- withdrawn,
- replaced by a revised edition, or
- amended.

A bilingual version of this publication may be issued at a later date.

INTRODUCTION

Time and control code is standardized in IEC 60461 and SMPTE ST 12-1:2008. Transmission of time code is standardized in SMPTE ST 12-2:2008.

Reference signal is often used for professional video storage in order to synchronize all equipment in a system. However there are no clear specifications for the transmission of time code under such system operation in these standards. When the system treats progressive video whose frame rate is 50 Hz or 59,94 Hz and when it uses reference signal, time code transmission of equipment may be treated differently and the interoperability may not be maintained.

Therefore, clear guidelines of time code transmission for professional video storage in such a system operation are expected.

PROFESSIONAL VIDEO STORAGE EQUIPMENT – GUIDELINE OF TIME CODE TRANSMISSION

1 Scope

This Technical Specification specifies the relationship between the reference signal and Ancillary Time Code (ATC) for use in professional storage equipment operating at 50 frames-per-second or 59,94 frames-per-second and handling progressive video signal under the system operation to maintain the frame pair which is composed of two frames.

2 Normative references

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

SMPTE ST 12-1:2008, *Television – Time and Control Code*

SMPTE ST 12-2:2008, *Television – Transmission of Time Code in the Ancillary Data Space*

SMPTE ST 318:1999, *Television and Audio – Synchronization of 59.94 – or 50-Hz Related Video and Audio Systems in Analog and Digital Areas – Reference Signals*

SMPTE ST 274:2008, *Television – 1 920 × 1 080 Image Sample Structure, Digital Representation and Digital Timing Reference Sequences for Multiple Picture Rates*

3 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

3.1

time code

abbreviation of time and control code defined in SMPTE ST 12-1:2008

3.2

frame pair

two time-consecutive frames of a video signal for which there is a first frame and a second frame

3.3

ATC_VITC1

Ancillary Time Code Vertical Interval Code #1 Payload Type defined in SMPTE ST 12-2:2008

3.4

ATC_VITC2

Ancillary Time Code Vertical Interval Code #2 Payload Type defined in SMPTE ST 12-2:2008

3.5

field mark flag

field identification flag defined in SMPTE ST 12-1:2008