INTERNATIONAL STANDARD

IEC 62298-2

First edition
2005-05

TeleWeb application –

Part 2:
Delivery methods

Reference number
IEC 62298-2:2005(E)

Publication numbering

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Commission Electrotechnique Internationale
International Electrotechnical Commission
Международная Электротехническая Комиссия

PRICE CODE W

For price, see current catalogue

CONTENTS

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TELEWEB APPLICATION –

Part 2: Delivery methods

FOREWORD

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International Standard IEC 62298-2 has been prepared by IEC technical committee 100: Audio, video and multimedia systems and equipment.

This standard cancels and replaces IEC/PAS 62298 published in 2002.

This first edition constitutes a technical revision.

The text of this standard is based on the following documents:

FDIS	Report on voting
100/923/FDIS	100/961/RVD

Full information on the voting for the approval of this standard 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.

IEC 62298 consists of the following parts, under the general title *TeleWeb application*:

Part 1: General description

Part 2: Delivery methods

Part 3: Superteletext profile

Part 4: Hyperteletext profile

The committee has decided that the contents of this publication will remain unchanged until the maintenance result 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

- reconfirmed;
- withdrawn;
- replaced by a revised edition, or
- amended.

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

INTRODUCTION

The aim of TeleWeb is to deliver World Wide Web-style content to the living-room TV to give the viewer an enhanced television experience. A TeleWeb service broadcasts data files containing text and high-definition graphics to suitable decoders. The data transmitted can be closely linked to events within the accompanying TV programmes or can be more general in nature to emulate a traditional, but higher definition, superteletext service. Different profiles are defined.

It is intended that TV-based decoders be implemented in a cost-effective manner without recourse to the technology normally associated with personal computers. In part, this is achieved by limiting the number of different types of multimedia data that can be used within a service. By careful design of the user interface, decoder manufacturers will be able to offer easy-to-use equipment for accessing TeleWeb services without requiring the consumer to be computer-literate. In addition, they will be able to customize their products to differentiate them from those of their competitors.

This standard focuses on the transmission layer.

TELEWEB APPLICATION –

Part 2: Delivery methods

1 Scope

This part of IEC 62298 specifies the transmission layer of TeleWeb.

TeleWeb services can be broadcast in a number of different ways, for example, VBI, DVB, DAB, etc., and to a variety of decoder types, for example, TVs, portable decoders, PCs, etc. This standard specifies the transmission layer for VBI and DVB broadcasts.

2 Normative references

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

IEC 62298-1: *TeleWeb application – Part 1: General description*

IEC 62298-3: *TeleWeb application – Part 3: Superteletext profile*

IEC 62298-4: *TeleWeb application – Part 4: Hyperteletext profile*[1]

ISO/IEC 13818-1, *Information technology – Generic coding of moving pictures and associated audio information: Systems*

ISO/IEC 13818-6, *Information technology – Generic coding of moving pictures and associated audio information – Part 6: Extension for DSM-CC*

ISO 639-2, *Codes for the representation of names of languages – Part 2: Alpha-3 code*

ISO 8859-1, *Information technology – 8-bit single-byte coded graphic character sets – Part 1: Latin alphabet No. 1*

ETSI TR 101 154: V1.4.1, *Digital Video Broadcasting (DVB); Implementation guidelines for the use of MPEG-2 Systems, Video and Audio in satellite, cable and terrestrial broadcasting applications*

ETSI TR 101 202, *Implementation guidelines for data broadcasting, V1.1.1*

ETSI EN 300 421, *Digital Video Broadcasting (DVB); Framing structure, channel coding and modulation for 11/12 GHz satellite services*

ETSI EN 300 429, *Digital Video Broadcasting (DVB); Framing structure, channel coding and modulation for cable systems*

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[1] To be published.

ETSI EN 300 706, *Enhanced Teletext Specification*

ETSI EN 300 708, *Television Systems; Data Transmission within Teletext*

ETSI EN 300 744, *Digital Video Broadcasting (DVB); Framing structure, channel coding and modulation for digital terrestrial television*

ETSI EN 301 192*, Digital Video Broadcasting (DVB); DVB specification for data broadcasting, V1.2.1*

ETSI ETS 300 472, *Digital Video Broadcasting (DVB); Specification for conveying ITU-R System B Teletext in DVB bit streams*

3 Terms, definitions and abbreviations

3.1 Terms and definitions

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

3.1.1
bit ordering
in all schematics, numeric values ordered with the most significant bit at the left-hand side and the least significant bit at the right-hand side

3.1.2
conditional access (CA)
mechanism by which user access to service components can be restricted

3.1.3
Independent Data Line (IDL)
stand-alone Teletext packet containing both control and application data. It does not form part of a Teletext page. The packet address is either 30 or 31

3.1.4
module
when broadcast within a DSM-CC data carousel, the contents of a file and its attributes (for example, file type, creation date, etc.) are transmitted separately. The file itself is carried by a number of DDB messages and its attributes appear as descriptors within its module loop within a DII control message

3.1.5
signed integer
positive or negative integer value, in decimal notation. The first digit is preceded by a mandatory plus (+) or minus (–) symbol with no white space between the symbol and the first digit

3.1.6
text string
sequence of displayable Latin-1 characters

3.1.7
unsigned integer
integer value, in decimal notation, not preceded by a plus (+) or minus (–) symbol

3.2 Abbreviations

BSLBF	Bit String, Left Bit First
CA	Conditional Access
CRC	Cyclic Redundancy Check
DAB	Digital Audio Broadcasting
DDB	Download Data Block message
DII	Download Info Indication message
DSI	Download Server Initiate message
DSM-CC	Digital Storage Media Command and Control
DVB	Digital Video Broadcasting
ETS	European Telecommunication Standard
HTML	Hyper Text Mark-up Language
IDL	Independent Data Line
IEC	International Electrotechnical Commission
ISO	International Organisation for Standardization
LSB	Least Significant Bit
MJD	Modified Julian Date
MPEG	Moving Picture Experts Group
MSB	Most Significant Bit
OSI	Open Systems Interconnection
PES	Packetized Elementary Stream
PID	Packet Identifier
PMT	Program Map Table
RFC	Internet Requests for Comments
RPCHOF	Remainder Polynomial Coefficient, Higher Order First
SDT	Service Description Table
TS	Transport Stream
UIMSBF	Unsigned Integer Most Significant Bit First
URL	Uniform Resource Locator
UTC	Universal Time Coordinated
VBI	Vertical Blanking Interval

4 Delivery profiles

There are several ways in which a TeleWeb application can be delivered (see Figure 1 in IEC 62298-1). For the purposes of this document, a delivery profile specifies layers 1 to 4 of the OSI seven-layer model.

4.1 TeleWeb delivered via Teletext packets in VBI lines

Figure 1 shows layers 1 to 4 of the OSI seven-layer model for delivering a TeleWeb service via Teletext packets. The application files are formed into a DSM-CC data carousel at the transport layer, as defined in 5.1. The components of the carousel are then encapsulated in independent Teletext data packets (see 6.3). These are transmitted in the VBI lines of an analog TV signal as described in ETSI EN 300 708.

Layer	Generic content	TeleWeb specific content
Layer 4: Transport	Arranging the data in a suitable way for transport	DSM-CC data carousel: Blocks and modules Descriptors Groups and supergroups Delimiting between messages Forward error correction
Layer 3: Network	Logical functions related to the multiplexing and demultiplexing of data packets belonging to different communications flows: Data channel addressing Data packet sequencing	Format B independent data line as defined in ETSI EN 300 708 (“Packet 31”)
Layer 2: Link	Logical functions related to data transmission: Byte synchronization Error control (framing, misdirection and false detection) Data formatting	Normal Teletext packet format as defined in ETSI EN 300 706
Layer 1: Physical	Electrical transmission of the data signal	Normal Teletext parameters as defined in ETSI EN 300 706

IEC 679/05

Figure 1 – Delivery method for TeleWeb using Teletext packets in VBI lines

4.2 TeleWeb delivered via PES packets in an MPEG-2 TS

Figure 2 shows layers 1 to 4 of the OSI seven-layer model for delivering a TeleWeb service via Teletext packets. The application files are formed into a DSM-CC data carousel at the transport layer, as defined in 5.1. The components of the carousel are then encapsulated in independent Teletext data packets (see 6.3). These are transmitted in an MPEG-2 transport stream using PES packets as described in ETSI ETS 300 472.

NOTE The data is prepared as it would be for transmitting in 4.1, added to a transport stream and treated as an analog Teletext service.

Layer	Generic content	TeleWeb specific content
Layer 4: Transport	Arranging the data in a suitable way for transport	Embedding in DSM-CC data carousel as specified in this standard
Layer 3: Network	Logical functions related to the multiplexing and demultiplexing of data packets belonging to different communications flows: Data channel addressing Data packet sequencing	Embedding in Format B independent data line as defined in ETSI EN 300 708 (“Packet 31”)
Layer 2: Link	Logical functions related to the data transmission: Byte synchronization Error control (framing, misdirection and false detection) Data formatting	Embedding in an MPEG-2 transport stream using PES packets ETSI ETS 300 472
Layer 1: Physical	Electrical transmission of the data signal	Multiplexing and transmission according to DVB-T ETSI EN 300 744, DVB-C ETSI EN 300 429 or DVB-S ETSI EN 300 421

IEC 680/05

Figure 2 – Delivery method for TeleWeb using PES packets in an MPEG-2 TS

4.3 TeleWeb delivered via DSM-CC sections in an MPEG-2 TS

Figure 3 shows layers 1 to 4 of the OSI seven-layer model for delivering a TeleWeb service via DSM-CC sections. The application files are formed into a DSM-CC data carousel at the transport layer, as defined in 5.1. The components of the carousel are then encapsulated in DSM-CC sections in an MPEG-2 transport stream as described in ISO/IEC 13818-6.

Layer	Generic content	TeleWeb specific content
Layer 4: Transport	Arranging the data in a suitable way for transport	Embedding in DSM-CC data carousel as specified in this standard
Layer 3: Network	Logical functions related to the multiplexing and demultiplexing of data packets belonging to different communications flows: Data channel addressing Data packet sequencing	Embedding in DSM-CC sections as specified in this standard
Layer 2: Link	Logical functions related to the data transmission: Byte synchronization Error control (framing, misdirection and false detection) Data formatting	Embedding in TS packets as specified in ISO/IEC 13818-6
Layer 1: Physical	Electrical transmission of the data signal	Multiplexing and transmission according to DVB-T ETSI EN 300 744, DVB-C ETSI EN 300 429 or DVB-S ETSI EN 300 421

IEC 681/05

Figure 3 – Delivery method for TeleWeb using DSM-CC sections in an MPEG-2 TS

4.4 TeleWeb delivered via other methods

This standard will be amended when necessary with other transport methods.

5 Transport layer protocols

This clause defines protocols for implementing the transport layer.

5.1 DSM-CC data carousel

5.1.1 Overview

The files of a TeleWeb service are organized in DSM-CC data carousels according to the general principles defined in ISO/IEC 13818-6 and adapted for DVB applications as described in ETSI EN 301 192 and ETSI TR 101 202. The DSM-CC data carousel specification embodies the cyclic transmission of data to receivers. The data transmitted within a carousel is first organized into “modules”, which are then subdivided into “blocks”. All the blocks of all modules within the data carousel are of the same size, except for the last block of each module, which may be of a smaller size. Each individual file in a TeleWeb service is treated as a module. Modules can be clustered together to form a “group”. Likewise, groups can be clustered to form “supergroups”.

The data carousel specification defined here uses three messages from the full data carousel specification defined in ISO/IEC 13818-6. The data blocks are carried in DownloadDataBlock (DDB) messages, while control over the modules is provided by DownloadInfoIndication (DII) and DownloadServerInitiate (DSI) messages. Other DSM-CC messages listed in ISO/IEC 13818-6 are not used in the TeleWeb application and should be ignored by receivers designed to this edition. All messages begin with the generic DSM-CC Message Header.[2]

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2 ISO/IEC 13818-6, Clause 2.