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Digitalna videoradiodifuzija (DVB) i Povratni kanal prek digitalnih izboljšanih brezvrviĉnih telekomunikacij (DECT)

Digital Video Broadcasting (DVB); Interaction channel through the Digital Enhanced Cordless Telecommunications (DECT)

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Digital Video Broadcasting (DVB); Interaction channel through the Digital Enhanced Cordless Telecommunications (DECT)

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DVB

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Foreword

This European Standard (Telecommunications series) has been produced by the Joint Technical Committee (JTC) Broadcast of the European Broadcasting Union (EBU), Comité Européen de Normalisation ELECtrotechnique (CENELEC) and the European Telecommunications Standards Institute (ETSI).

NOTE: The EBU/ETSI JTC was established in 1990 to co-ordinate the drafting of standards in the specific field of broadcasting and related fields. Since 1995 the JTC became a tripartite body by including in the Memorandum of Understanding also CENELEC, which is responsible for the standardization of radio and television receivers. The EBU is a professional association of broadcasting organizations whose work includes the co-ordination of its members' activities in the technical, legal, programme-making and programme-exchange domains. The EBU has active members in about 60 countries in the European broadcasting area; its headquarters is in Geneva.

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DVB Project

Founded in September 1993, the DVB Project is a market-led consortium of public and private sector organizations in the television industry. Its aim is to establish the framework for the introduction of MPEG-2 based digital television services. Now comprising over 200 organizations from more than 25 countries around the world, DVB fosters market-led systems, which meet the real needs, and economic circumstances, of the consumer electronics and the broadcast industry.

National transposition dates	
Date of adoption of this EN:	24 July 1998
Date of latest announcement of this EN (doa):	31 October 1998
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1 Scope

The present document is the baseline specification for the provision of an interaction channel based on the Digital Enhanced Cordless Telecommunications (DECT) to Digital Video Broadcasting (DVB) systems.

The DVB Project does not intend to specify an interaction channel solution associated to each broadcast system because the interoperability of different delivery media to transport the interaction channel is desirable. Therefore, the DECT solution for the interaction channel apply to satellite, cable, MATV, Satellite Master Antenna TeleVision (SMATV), terrestrial, microwave or any future DVB broadcasting or distribution system.

The solutions provided in the present document for an interaction channel through the DECT are a part of a wider set of alternatives to implement interactive services for DVB systems.

2 References

References may be made to:

- a) specific versions of publications (identified by date of publication, edition number, version number, etc.), in which case, subsequent revisions to the referenced document do not apply; or
- b) all versions up to and including the identified version (identified by "up to and including" before the version identity); or
- c) all versions subsequent to and including the identified version (identified by "onwards" following the version identity); or
- d) publications without mention of a specific version, in which case the latest version applies.

A non-specific reference to an ETS shall also be taken to refer to later versions published as an EN with the same number.

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2.1 Normative references

- [1] ETS 300 802: "Digital Video Broadcasting (DVB); Network-independent protocols for DVB interactive services".
- [2] EN 50201: "Interfaces for DVB-IRDs" CENELEC.
- [3] ETS 300 765-2: "Digital Enhanced Cordless Telecommunications (DECT); Radio in the Local Loop (RLL) Access Profile (RAP); Part 2: Advanced telephony services".
- [4] EN 301 240: "Digital Enhanced Cordless Telecommunications (DECT); Data Services Profile (DSP); Point-to-Point Protocol (PPP) interworking for internet access and general multi-protocol datagram transport".
- [5] ETS 300 700: "Digital Enhanced Cordless Telecommunications (DECT); Wireless Relay Station (WRS)".

2.2 Informative references

- [6] DVB-A008 (October 1995): "Commercial requirements for asymmetric interactive services supporting broadcast to the home with narrow-band return channels".
- [7] ETS 300 765-1: "Digital Enhanced Cordless Telecommunications (DECT); Radio in the Local Loop (RLL) Access Profile (RAP); Part 1: Basic telephony services".
- [8] ETS 300 444: "Radio Equipment and Systems (RES); Digital European Cordless Telecommunications (DECT); Generic Access Profile (GAP)".

- [9] DE/RES-03039: "Radio Equipment and Systems (RES); Digital European Cordless Telecommunications (DECT); DECT/ISDN Interworking for Intermediate System Configuration, Part 1: Interworking Specification and Part 2: Access profile".
- [10] ETR 308: "Digital Enhanced Cordless Telecommunications (DECT); Services, facilities and configurations for DECT in the local loop".
- [11] ETR 185: "Digital European Cordless Telecommunications (DECT); Data Services Profile (DSP); Profile overview".
- [12] ETS 300 651: "Digital Enhanced Cordless Telecommunications (DECT); Data Services Profile (DSP); Generic data link service;(Service type C, class 2)".
- [13] ETS 300 701: "Digital Enhanced Cordless Telecommunications (DECT); Data Services Profile (DSP); Generic frame relay service with mobility (service types A and B, class 2)".

3 Abbreviations

For the purposes of the present document, the following abbreviations apply:

A/V	Audio/Video
BC	Broadcast Channel
CI	Common Interface
CTA	Cordless Terminal Adapter
DAM	DECT Authentication Module
DECT	Digital Enhanced Cordless Telecommunications
DSP	Data Services Profile
FP	Fixed Part
FT	Fixed Termination
GAP	Generic Access Profile
IC	Interaction Channel
IIM	Interactive Interface Module
IN	Interactive Network
INA	Interactive Network Adapter
IRD	Integrated Receiver Decoder
ISDN	Integrated Services Digital Network
IWU	Inter-Working Unit
LAP	Link Access Protocol
LLME	Lower Layer Management Entity
MAC	Medium Access Control
MATV	Master Antenna Television
NIU	Network Interface Unit
NTU	Network Termination Unit
NWK	Network
OSI	Open Systems Interconnection
PHL	Physical
PP	Portable Part
PPP	Point to Point Protocol
PSTN	Public Switched Telephone Network
RAP	Radio in the local loop Access Profile
RF	Radio Frequency
RLL	Radio in the Local Loop
SMATV	Satellite Master Antenna TeleVision
STB	Set Top Box
STU	Set Top Unit
WRS	Wireless Relay Station

4 Reference model

A reference model for the system architecture of narrow-band interaction channels in a broadband scenario (asymmetric interactive services) is presented in this clause.

4.1 Protocol stack model

Within the Digital Video Broadcasting (DVB) commercial requirements for asymmetric interactive services supporting broadcast to the home with narrow-band return channel (see DVB-A008 [6]), a simple communications model has been used to identify the necessity and importance of each commercial requirement consisting of the following layers (the layers do not coincide exactly with the Open Systems Interconnection (OSI) layers):

Physical layer: Where all the physical (electrical) transmission parameters are defined;

Transport layer: Defines all the relevant data structures and communication protocols like data containers, etc.;

Application layer: Is the interactive application software and runtime environment (e.g. home shopping application, script interpreter, etc.).

The present document addresses the lower two layers (the physical and transport layers), leaving the application layer open to competitive market forces. A simplified model of the OSI layers was adopted to facilitate the production of specifications for these nodes. Figure 1 points out the lower layers of the simplified model and identifies some of the key parameters. Following the user requirements for interactive services, no attempt will be made to consider higher layers in the present document.

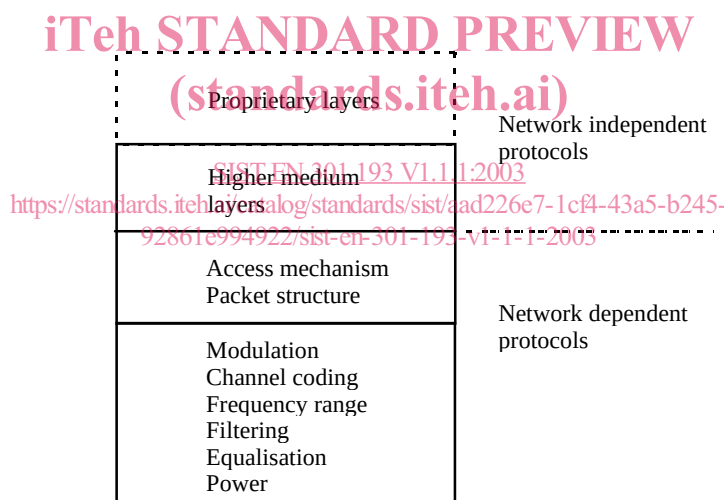


Figure 1: Layer structure for generic system reference model

The present document addresses the Digital Enhanced Cordless Telecommunications (DECT) specific aspects only. The network-independent protocols are specified separately in ETS 300 802 [1].

4.2 System model

Figure 2 shows the system model which is to be used within DVB for interactive services. In the system model, two channels are established between the service provider and the user:

- a) **Broadcast Channel (BC):** A uni-directional broadband BC including video, audio and data. BC is established from the service provider to the users. It may include the forward interaction path.
- b) **Interaction Channel (IC):** A bi-directional interaction channel is established between the service provider and the user for interaction purposes. It is formed by:

- **Return interaction path** (return channel): From the user to the service provider. It is used to make requests to the service provider or to answer questions. It is a narrow-band channel. Also commonly known as return channel.
- **Forward interaction path:** From the service provider to the user. It is used to provide some sort of information by the service provider to the user and any other required communication for the interactive service provision. It may be embedded into the broadcast channel. It is possible that this channel is not required in some simple implementations which make use of the BC for the carriage of data to the user.

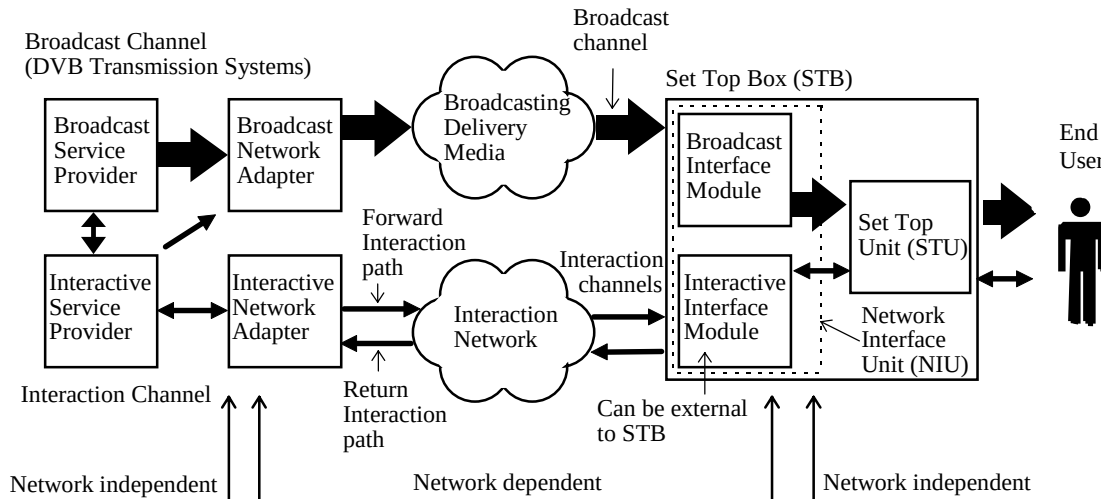


Figure 2: A generic system reference model for interactive systems

The user terminal, here named Set Top Box (STB), is formed by the:

- a) Network Interface Unit (NIU), consisting of the:
 - 1) Broadcast Interface Module (BIM);
 - 2) Interactive Interface Module (IIM); and
- b) Set Top Unit (STU).

The user terminal provides interfaces for both broadcast and interaction channels. The interface between the user terminal and the interaction network is via the IIM.

5 DVB interaction channel specification for DECT

A DECT infrastructure can support the implementation of the interaction channel for DVB broadcasting systems by providing a wireless bi-directional communication path between the user terminal and an infrastructure connecting to the service provider.

The basic characteristics of DECT are described in annex A.

5.1 System architecture

The Interactive Interface Module (IIM) is implemented through a DECT Portable Part (PP) (see figure 3). The DECT PP can be internal or external to the STB.

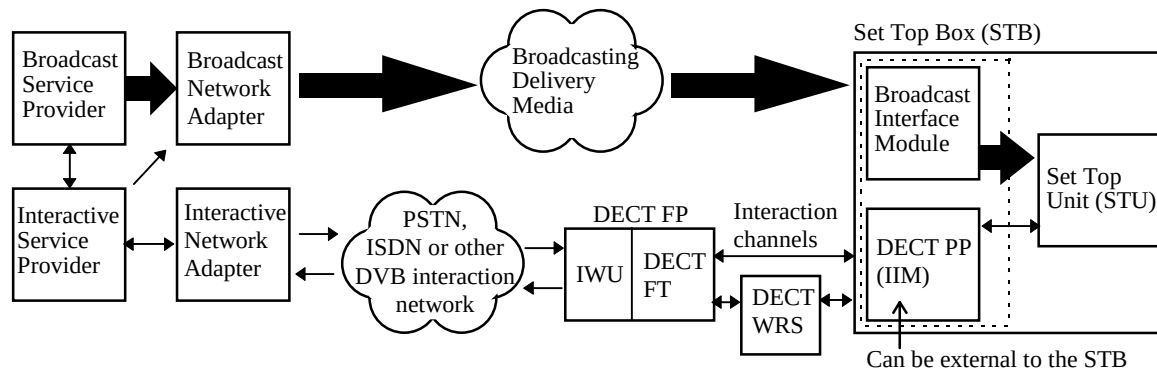


Figure 3: System architecture when DECT is used as the interaction channel

DECT is a wireless access technology, not a complete network or system. Therefore, DECT Fixed Parts (FP) are part of the interaction network. A DECT FP includes an Inter-Working Unit (IWU) which handles the interconnection of DECT with the Interactive Network Adapter (INA) via another interaction network.

5.2 Physical interfaces

The physical interfaces relate to how the DECT PP is connected to the STU, how the DECT FP is connected to other interaction networks and the wireless physical interfaces between DECT PP, DECT FP and DECT Wireless Relay Stations (WRS). The DECT profiles specify the physical interfaces for different services and applications (see subclause 5.4).

In the case of a DECT PP external to the STB, the DVB-IRD interfaces are described in EN 50201 [2].

5.3 Calling procedures

The signalling protocols are specified by the DECT profiles (see subclause 5.4).

5.4 DECT profiles

The connection of DECT to different networks, the operation of the DECT air interface and the signalling protocols for specific services and applications are described in the DECT profiles. A DVB operator using DECT as the interaction channel should use DECT profiles. Several DECT profiles can be supported in a DECT system, which means that other profiles can be supported in parallel with the profile used to carry the DVB network independent protocols for interactive services (see ETS 300 802 [1]).

The default implementations described in subclauses 5.4.1 and 5.4.2 are based on the Radio in the local loop Access Profile (RAP) (see ETS 300 765-2 [3]) and the Data Services Profile (DSP) PPP interworking (see EN 301 240 [4]). The RAP offers valuable operation and maintenance functions. DSP PPP interworking offers effective handling of data traffic and describes the interworking to different fixed networks. When accessing an external DECT infrastructure, RAP functions are used in combination with the DSP PPP interworking.

Due to the flexible nature of the DECT standard, several other implementation possibilities exist. Some of the implementation alternatives are described in annex B.

5.4.1 Recommended DECT profiles when the DECT infrastructure is external to the home

The RAP (see ETS 300 765-1 [7] and ETS 300 765-2 [3]), describes how DECT is used in Radio in the Local Loop (RLL) scenarios.