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Technical Specification

**Digital Enhanced Cordless Telecommunications (DECT);
DECT in the 1 920 MHz to 1 930 MHz Unlicensed Personal
Communications Services (UPCS) frequency band;
Specific requirements**



Reference

DTS/DECT-00240

Keywords

data, DECT, interworking, multimedia, profile,
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Foreword

This Technical Specification (TS) has been produced by ETSI Project Digital Enhanced Cordless Telecommunications (DECT).

The present document is based on DECT Common Interface (CI) specification EN 300 175, parts 1 [1] to 8 [8], to enable DECT terminals to interwork in the public and private environment.

In addition, for the purpose of interoperability and wherever it is found appropriate, the present document takes into consideration requirements specified in various DECT profiles; reference to relevant profiles is provided whenever appropriate.

General attachment requirements are based on EN 301 406 [9].

Further details on the DECT system may be found in TR 101 178 [11].

Introduction

Since its introduction in the early 90s the DECT technology has enjoyed world wide acceptance with most of the countries accepting in full the original DECT requirements specified in the extensive DECT standards set developed and published by ETSI (www.etsi.org). Some regions, due to specific local requirements, have used the DECT standard and modified it to comply with those specific requirements.

The Personal Wireless Telecommunications (PWT) interoperability standards, PWT and PWT/E, in North America (standardized in 1995 within the Telecommunications Industry Association (TIA)), are based on DECT Generic Access Profile (GAP) and provide basically the same services as DECT GAP. PWT and PWT/E uses the DECT frame structure, MAC, DLC, etc., but has a different modulation and different bandwidth and carrier spacing to meet local regulatory requirements. PWT operates in the US unlicensed band 1920 MHz to 1930 MHz. PWT-E is an extension into the licensed bands 1 850 MHz to 1 910 MHz and 1930 MHz to 1 990 MHz.

In September 2004 the United States (US) Federal Communications Commission (FCC), in FCC 04-219, Sixth Report and Order, Third Memorandum Opinion and Order, and Fifth Memorandum Opinion and Order [24], introduced modifications to the requirements applicable to the 1 920 MHz to 1 930 MHz Unlicensed Personal Communications Services (UPCS) frequency band. The modification enhanced the existing rules for isochronous UPCS operations in the 1 920 MHz to 1 930 MHz band in order to provide additional flexibility, thereby permitting the deployment of additional unlicensed devices in the band operating on a wider variety of technologies aimed at providing "a wide array of mobile and ancillary fixed communication services to individuals and businesses".

The current specification provides the necessary requirements to allow DECT terminals deployment in the US 1 920 MHz to 1 930 MHz UPCS frequency band in accordance to the new rules. Clause 4 provides the basic DECT protocol reference model and indicates the affected functionality areas. Clause 5 specifies the relevant requirements. Annex A provides information on market acceptance and product availability of DECT.

1 Scope

The present document specifies that set of technical requirements for Digital Enhanced Cordless Telecommunications (DECT) Fixed Part (FP) and DECT Portable Part (PP) necessary for the support and provision to the user of various multimedia services in the 1 920 MHz to 1 930 MHz Unlicensed Personal Communication Service (UPCS) frequency band in accordance with the modifications introduced by the United States (US) Federal Communications Commission (FCC) FCC 04-219, Sixth Report and Order, Third Memorandum Opinion and Order, and Fifth Memorandum Opinion and Order [24].

2 References

The following documents contain provisions which, through reference in this text, constitute provisions of the present document.

- References are either specific (identified by date of publication and/or edition number or version number) or non-specific.
- For a specific reference, subsequent revisions do not apply.
- For a non-specific reference, the latest version applies.

Referenced documents which are not found to be publicly available in the expected location might be found at <http://docbox.etsi.org/Reference>.

- [1] ETSI EN 300 175-1: "Digital Enhanced Cordless Telecommunications (DECT); Common Interface (CI); Part 1: Overview".
- [2] ETSI EN 300 175-2: "Digital Enhanced Cordless Telecommunications (DECT); Common Interface (CI); Part 2: Physical Layer (PHL)".
- [3] ETSI EN 300 175-3: "Digital Enhanced Cordless Telecommunications (DECT); Common Interface (CI); Part 3: Medium Access Control (MAC) layer".
- [4] ETSI EN 300 175-4: "Digital Enhanced Cordless Telecommunications (DECT); Common Interface (CI); Part 4: Data Link Control (DLC) layer".
- [5] ETSI EN 300 175-5: "Digital Enhanced Cordless Telecommunications (DECT); Common Interface (CI); Part 5: Network (NWK) layer".
- [6] ETSI EN 300 175-6: "Digital Enhanced Cordless Telecommunications (DECT); Common Interface (CI); Part 6: Identities and addressing".
- [7] ETSI EN 300 175-7: "Digital Enhanced Cordless Telecommunications (DECT); Common Interface (CI); Part 7: Security features".
- [8] ETSI EN 300 175-8: "Digital Enhanced Cordless Telecommunications (DECT); Common Interface (CI); Part 8: Speech coding and transmission".
- [9] ETSI EN 301 406: "Digital Enhanced Cordless Telecommunications (DECT); Harmonized EN for Digital Enhanced Cordless Telecommunications (DECT) covering essential requirements under article 3.2 of the R&TTE Directive; Generic radio".
- [10] ETSI EN 301 489-6: "Electromagnetic compatibility and Radio spectrum Matters (ERM); ElectroMagnetic Compatibility (EMC) standard for radio equipment and services; Part 6: Specific conditions for Digital Enhanced Cordless Telecommunications (DECT) equipment".
- [11] ETSI TR 101 178: "Digital Enhanced Cordless Telecommunications (DECT); A High Level Guide to the DECT Standardization".
- [12] ETSI EN 300 444: "Digital Enhanced Cordless Telecommunications (DECT); Generic Access Profile (GAP)".

- [13] ETSI EN 301 649: "Digital Enhanced Cordless Telecommunications (DECT); DECT Packet Radio Service (DPRS)".
- [14] ETSI TS 102 342: "Digital Enhanced Cordless Telecommunications (DECT); Cordless Multimedia Communication System; Open Data Access Profile (ODAP)".
- [15] ETSI EN 300 757: "Digital Enhanced Cordless Telecommunications (DECT); Low Rate Messaging Service (LRMS) including Short Messaging Service (SMS)".
- [16] ETSI TS 102 379: "Digital Enhanced Cordless Telecommunications (DECT); Fixed network Multimedia Message Service (F-MMS) Interworking Profile".
- [17] ETSI EN 300 700: "Digital Enhanced Cordless Telecommunications (DECT); Wireless Relay Station (WRS)".
- [18] ETSI TS 102 265: "Digital Enhanced Cordless Telecommunications (DECT); DECT Access to IP networks".
- [19] ETSI EN 300 466: "Digital Enhanced Cordless Telecommunications (DECT); Global System for Mobile communications (GSM); DECT/GSM Interworking Profile (IWP); General description of service requirements; Functional capabilities and information flows".
- [20] ETSI EN 301 242: "Digital Enhanced Cordless Telecommunications (DECT); Global System for Mobile communications (GSM); DECT/GSM integration based on dual-mode terminals".
- [21] ETSI TS 101 863-1: "Digital Enhanced Cordless Telecommunications (DECT); DECT/UMTS Interworking Profile (IWP); Part 1: General description and overview".
- [22] ETSI EN 300 765-1: "Digital Enhanced Cordless Telecommunications (DECT); Radio in the Local Loop (RLL) Access Profile (RAP); Part 1: Basic telephony services".
- [23] ETSI EN 300 765-2: "Digital Enhanced Cordless Telecommunications (DECT); Radio in the Local Loop (RLL) Access Profile (RAP); Part 2: Advanced telephony services".
- [24] FCC 04-219: "Sixth Report and Order, Third Memorandum Opinion and Order, and Fifth Memorandum Opinion and Order".
- [25] FCC Part 15: <http://www.fcc.gov/oet/info/rules/part15/>
- [26] ANSI C63.17: "(Draft) American National Standard for Methods of Measurement of the Electromagnetic and Operational Compatibility of Unlicensed Personal Communications Services (UPCS) Devices". Revision Draft 3.0, April 25, 2005.
- [27] ANSI C63.4: "American National Standard for Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the Range of 9 kHz to 40 GHz".
- [28] ANSI/IEEE C95.1: "Safety Levels with Respect to Human Exposure to Radio Frequency. Electromagnetic Fields, 3 kHz to 300 GHz".
- [29] ITU-R Recommendation M.1457: "Detailed specifications of the radio interfaces of International Mobile Telecommunications-2000 (IMT-2000)".
- [30] FCC 02-151: "Federal Communications Commission, Second Report and Order, Amendment of Part 15 of the Commission's Rules Regarding Spread Spectrum Devices".

3 Definitions and abbreviations

3.1 Definitions

For the purposes of the present document, the terms and definitions given in EN 300 175-1 [1] and the following apply:

example 1: text used to clarify abstract rules by applying them literally

NOTE: This may contain additional information.

3.2 Abbreviations

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

3GPP	3rd Generation Partnership Project
AC	Alternating Current
ANSI	American National Standards Institute
CI	Common Interface
DECT	Digital Enhanced Cordless Telecommunications
DLC	Data Link Control protocol layer
DPRS	DECT Packet Radio Service
EN	European Norm
ETSI	European Telecommunications Standards Institute
FCC	Federal Communications Commission
F-MMS	Fixed line-Multimedia Messaging Service
FP	Fixed Part
FT	Fixed Termination
GAP	Generic Access Profile
GSM	Global System for Mobile communications
IP	Internet Protocol
ISM	Industrial Scientific Medical
kbps	kilo bits per second
LIC	Least Interfered Channel
LRMS	Low Rate Messaging Service
MAC	Medium Access Control protocol layer
MMS	Multimedia Messaging Service
ODAP	Open Data Access Profile
PABX	Private Automatic Branch eXchange
PCS	Personal Communications Services
PP	Portable Part
ppm	parts per million
PWT	Personal Wireless Telecommunications
R&TTE	Radio communications and Telecommunications Terminal Equipment
RF	Radio Frequency
RSSI	Radio Signal Strength Indicator
SMS	Short Message Service
TIA	Telecommunications Industry Association
TR	Technical Report
TS	Technical Specification
UMTS	Universal Mobile Telecommunications System
UPCS	Unlicensed Personal Communications Services
US	United States
UTAM	Unlicensed Transmission And Management
WLL	Wireless Local Loop

4 DECT protocol reference model

Figure 1 shows which of the layers of the DECT protocol stack are affected by the UPCS rules. The layers 2b and above are not affected at all.

The layer 2a (Media Access Control layer) needs only some minor additions.

The layer 1 (Physical layer) is almost identical with standard DECT. For UPCS the used carrier frequencies are within the band 1 920 MHz to 1 930 MHz and are broadcast by the base station. The maximum allowed transmit power is slightly lower than in standard DECT, but can also be broadcast by the base station, as specified in EN 300 175-3 [3] ((V1.9.1) or later).

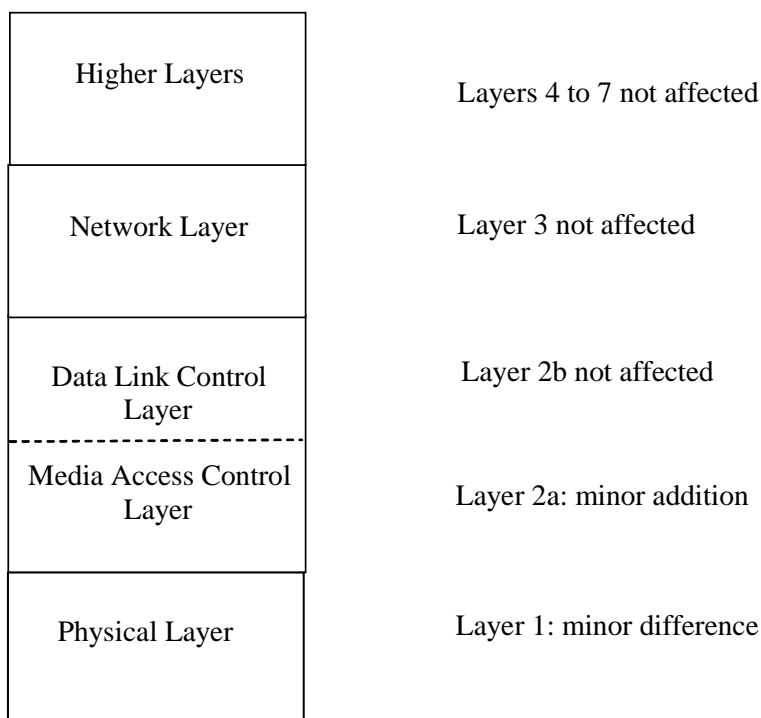


Figure 1: DECT protocol stack

5 DECT UPCS 1 920 MHz to 1 930 MHz FCC requirements

This clause provides a reference and/or explicitly specifies requirements to DECT terminals/systems implementations to satisfy the specific UPCS 1 920 MHz to 1 930 MHz FCC requirements [25].

NOTE: Test and Certification Procedures for UPCS equipment.

For FCC approval there are two main steps:

- Testing at an FCC "Listed Laboratory", and
- Certification by the FCC or a by a TCP (Telecommunication Certification Body).

Test houses and many larger manufacturers have a listed laboratory, where the tests can be carried out.

At the certification process documents from the laboratory tests are reviewed, whereafter an FCC grant is given if all is in order. At this stage (2005) it is best to ask the FCC for certification, because the FCC has good knowledge of the new UPCS tests, and because very few TCPs are approved for UPCS (have UPCS scope). For more information contact the FCC (Joe.Dichoso@fcc.gov).

The requirements specified below, are only those which have to be changed or added in relation to European DECT requirements [9], in order to comply with the FCC requirements [25] and its interpretation as given by the related test document ANSI C63.17 [26].

The following parameters are, or may be, affected: The frequency band, RF frequency stability, Peak transmit power, Antenna gain, Antenna connector, Receiver bandwidth, Definition of channels in the channel selection list (including which slots to monitor and "quiet" and "busy" channel levels), Maximum time between updates of the channel list, Maximum time for dummy bearer and duplex bearer without new channel measurement, Reaction time of RSSI detector and membership in UTAM.

For each parameter references are given to the relevant EN 300 175-3 [3], EN 301 406 [9], FCC [25] and ANSI-C 6317 [26] (test) documents.

5.1 Carrier frequencies

DECT equipment for the UPCS band 1 920 MHz to 1 930 MHz shall operate on any or all of the 5 carriers 1 921,536 MHz, 1 923,264 MHz, 1 924,992 MHz, 1 926,720 MHz and 1 928,448 MHz. See EN 300 175-2 [2], clause F.2.

5.2 Antenna connector

FCC references: Part 15 [25], section 15.317.

It is required that if the external antenna is detachable, the connector shall not be of standard type. This requirement does not apply if the transmitter equipment has to be professionally installed.

5.3 RF frequency stability

ETSI reference: EN 301 406 [9], clause 4.5.1 referring to EN 300 175-2 [2], clause 4.1.2.

FCC references: Part 15 [25], section 15.323(f).

ANSI references: C63.17 [26], clause 6.2.1.

EN 301 406 [9], requires ± 25 ppm and the FCC requires ± 10 ppm at extreme temperatures as defined by the manufacturer, see C63.17 [26], clause 6.2.1. The equipment shall fulfill the FCC requirements.

5.4 Peak transmit power

ETSI references: EN 301 406 [9], clause 4.5.4.

FCC references: Part 15 [25], sections 15.303(c), 15.319(c) and 15.319(e).

ANSI references: C63.17 [26], clauses 4.3.1, 6.1.2 and 6.1.3.

P_{NTP} shall be $100 \times B^{1/2}$ mW, where the B is the bandwidth in MHz. This bandwidth is defined in Part 15.303(c). B for DECT could be varied from 1,5 MHz to 2,5 MHz depending on modulation index setting.

Thus P_{NTP} becomes minimum 21 dBm and maximum 22 dBm, depending on selected setting of the bandwidth parameter.

Furthermore, the above level of P_{NTP} shall be reduced by the amount in decibels that the maximum directional gain of the antenna exceeds 3 dBi.

5.5 Disable transmitter in case of failure

FCC references: Part 15 [25], section 15.319(f).

ANSI references: C63.17 [26], clause 4.11.

The device shall automatically discontinue transmission in case of either absence of information to transmit or operational failure. These provisions are not intended to preclude transmission of control and signalling information or use of repetitive codes used by certain digital technologies to complete frame or burst intervals. A declaration with explanation of how the requirements of this clause are met is required.

5.6 Maximum transmit period - general

FCC references: Part 15 [25], section 15.323(c)(3).

ANSI references: C63.17 [26], clauses 8.2.2.

Occupation of the same combined time and spectrum windows by a device or group of cooperating devices continuously over a period of time longer than 8 hours is not permitted without repeating the access criteria.

A practical application of this requirement is to force an intra-cell handover, if the same access channel has been used for more than H hours, where $H < 8$ hours. There is no corresponding ETSI requirement.

5.7 Maximum transmit period for a dummy bearer

FCC references: Part 15 [25], section 15.323(c)(4).

ANSI references: C63.17 [26], clauses 8.1.1 and 8.1.2.

Channels used exclusively for control and signalling information may transmit continuously for 30 seconds without receiving an acknowledgment, at which time the access criteria shall be repeated. Standard DECT implementations repeat the access criteria every few seconds to check that the dummy bearer remains on a least interfered channel, so that the dummy can be well received within the whole cell, but there is no formal ETSI requirement on this. See EN 300 175-3 [3], clause 5.7.

5.8 Bandwidth of monitoring receiver

FCC references: Part 15 [25], section 15.323(c)(7).

ANSI references: C63.17 [26], clause 7.4.

There is no explicit ETSI bandwidth requirement for the monitoring receiver. It is however supposed that the communications receiver is also used as monitoring receiver. If this is the case, the FCC requirement is fulfilled. See ANSI C63.17 [26], clause 7.4.

5.9 Reaction time of RSSI detector of monitoring receiver

ETSI references: EN 300 175-2 [2], clause 8.3.

FCC references: Part 15 [25], section 15.323(c)(7).

ANSI references: C63.17 [26], clause 7.5.

The reaction time of the signal strength detector is not an EN 300 175-2 [2], mandatory requirement, but in EN 300 175-2 [2], clause 8.3 a time constant between 10 microseconds and 40 microseconds is recommended, which is similar to the FCC/ANSI requirement, which however is not defined as a time constant. If the margin when testing the upper "busy" threshold was very small, a time constant below 20 microseconds may be required.

5.10 Updating channel list

ETSI references: EN 301 406 [9], clause 4.5.10.1 referring to EN 300 175-3 [3], clauses 11.4.2 b and 11.4.3 a.

FCC references: Part 15 [25], section 15.323(c)(5).

The channel list shall be updated every 10 s (30 s in EN 300 175-3 [3]).

5.11 Field strength measurements for duplex connections

ETSI references: EN 301 406 [9], clause 4.5.10.1 referring to EN 300 175-3 [3], clause 11.4.1.

FCC references: Part 15 [25], section 15.323(c)(10).

ANSI references: C63.17 [26], clause 8.2.3.

For a duplex bearer both the transmit slot and the receive slot shall be monitored and the highest of the two RSSI values is the relevant RSSI value for the duplex bearer. EN 301 406 [9] only requires receive slot monitoring for selection by PP.

5.12 Upper threshold (busy) for channel selection

ETSI references: EN 301 406 [9], clause 4.5.10.1 referring to EN 300 175-3 [3], clause 11.4.1.

FCC references: Part 15 [25], section 15.323(c)(5).

ANSI references: C63.17 [26], clauses 7.3.2.

An upper "busy" threshold is required at a level of maximum 50 dB above the noise floor for the FCC defined emission bandwidth. For an emission bandwidth of 1,6 MHz, the threshold becomes -62 dBm.

5.13 Least Interfered Channel (LIC) confirmation

ETSI references: EN 301 406 [9], clause 4.5.10.1 referring to EN 300 175-3 [3], clauses 11.4.2 d and h and 11.4.3 g.

FCC references: Part 15 [25], section 15.323(c)(5).

ANSI references: C63.17 [26], clauses 7.3.4.

When confirming the RSSI of a LIC from the channel list just before transmitting, the RSSI shall be no higher than the previously detected value. The RSSI resolution requirement is however 6 dB as in EN 300 175-3 [3]. This is in EN 300 175-3 [3], clauses 11.4.2 (d) and 11.4.3 (g) interpreted so that in a channel list with band limits < 6 dB, the channel is accepted also if the new RSSI measurement falls in the band just above the original band. We regard this interpretation valid also for the FCC. However EN 300 175-3, clause 11.4.2.(h) at handover a value falling in up to two bands above the original band is accepted. This cannot be accepted by the FCC rule.

5.14 Conducted limits (AC mains connection)

FCC references: Part 15 [25], section 15.315.

ANSI reference: ANSI C63.4 [27].

An unlicensed PCS device that is designed to be connected to the public utility (AC) power line shall meet the limits specified in [25], section 15.207.

5.15 RF exposure requirements

ETSI references: EN 300 175-2 [2], annex A.

FCC references: Part 15 [25], section 15.319(i).

ANSI reference: ANSI/IEEE C95.1 [28].

US requirements are in practice about a factor two more restrictive than European requirements. The DECT power is however so small that the US tests will also be passed.

5.16 UTAM membership and fees

FCC references: Part 15 [25], section 15.307(b).

UTAM membership is a mandatory requirement for FCC certification of equipment operating in the UPCS band. The membership fee a one time fee of \$50 000, and \$0.5 per sold transmitter (per handset and per base station). For more details see <http://www.utam.org/ClearingFees.html>.

Annex A (informative): Market acceptance and product availability of DECT

A.1 Countries with spectrum for DECT applications

DECT is a world wide standard.

DECT is also an ITU IMT-2000 [29] family member, called IMT-FT, the only member that provides for uncoordinated installations on an unlicensed spectrum.

DECT has for many years already spectrum allocated within the IMT-2000 bands available in more than 110 countries (information from DECT Forum).

DECT carriers are specified in EN 300 175-2 [2] annex F for the whole frequency range 1 880 MHz to 1 980 MHz and 2 010 MHz to 2 025 MHz.

The most common protected spectrum allocation is 1 880 MHz to 1 900 MHz, but outside Europe spectrum is also available in 1 900 MHz to 1 920 MHz and in 1 910 MHz to 1 930 MHz (several countries in Latin America).

For applications and spectrum for the North American market see clause A.3.

A.2 System types

The majority of DECT shipments are in residential and small business applications in Europe. DECT dominates the European cordless residential market and the enterprise local (PABX) voice mobility market, and is expected to do so for several years ahead. The voice services dominate, but data applications increase.

DECT has proved to be cost effective for the low end consumer market, having potential for further cost reductions.

The DECT Dynamic Channel Selection and quick Handover procedures have also proved to be efficient and reliable for large office/industrial indoor/outdoor installations with 4 000 to 5 000 users per installation.

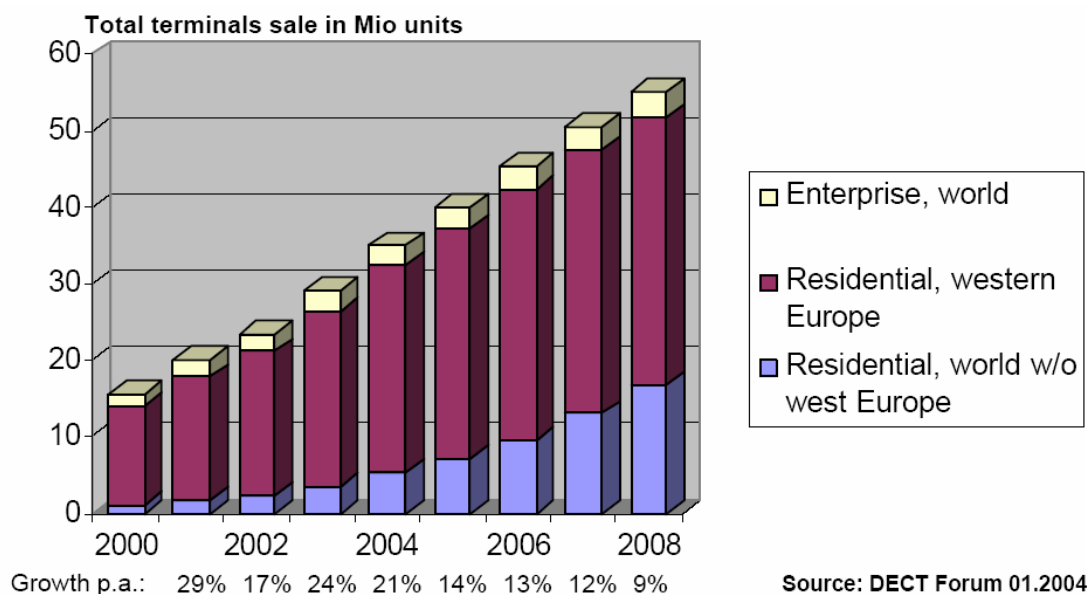


Figure A.1: Number of shipped DECT units per year

DECT is a mass market technology (see figure A.1 on annual sales). The residential applications dominate. Second comes the enterprise market. Third, not shown on figure A.1, comes DECT Wireless Local Loop (WLL) systems with markets predominantly in India, Africa and South America.

DECT is also technically well suited for WLL and public pedestrian applications. Interoperability profile standards are available for both applications. The WLL applications support voice telephony, ISDN and packet data internet user data access up to a few hundreds of kbps. This suits needs in developing countries. However, the general availability of subsidized cellular phones combined with low cost and low commitment subscription alternatives, limit the business opportunities for DECT public pedestrian implementations.

Being optimized for a low cost and low power consumption, makes DECT suitable for various home and industrial appliances solutions, e.g. wireless sensors, alarms, surveillance systems, etc.

Further details on the DECT system may be found in TR 101 178 [11].

A.3 DECT in the USA

A.3.1 The UPCS band

Since September 2004 standard DECT (with some minor modifications, see clause 5) can be applied in the US UPCS band 1 920 MHz to 1 930 MHz [24].

The UPCS band 1 920 MHz to 1 930 MHz provides a protected spectrum. The 20 MHz spectrum designated for DECT in Europe and many other countries require that equipment using this spectrum have to comply to the DECT dynamic channel selection procedures, power levels etc. Such a spectrum is here called a protected DECT spectrum. It provides for maintained high spectrum efficiency and maintained high quality radio links (e.g. speech and video) in an environment of a multitude of uncoordinated system installations. For the UPCS band there are also basic channel access rules etc. [25], which define (a family of) technologies that coexist well in an environment of uncoordinated system installation. The basic access rules are compatible with DECT access rules. Therefore, from a DECT perspective, the UPCS band is also a protected spectrum. However, since a broader range of system parameters are accepted for the UPCS band, than for a "pure" DECT band, spectrum efficiency becomes somewhat lower for the UPCS band.

NOTE: To meet the old UPCS rules, the Personal Wireless Telecommunications interoperability standards, PWT and PWT/E, were standardized in the year 1995 within the Telecommunications Industry Association, TIA. Those standards are based on DECT and provide basically the same services as DECT. PWT and PWT/E uses the DECT frame structure, MAC, DLC, etc., but has a different modulation and different bandwidth and carrier spacing to meet earlier UPCS regulatory requirements. PWT operates in the US Unlicensed Personal Communications Service (UPCS) band 1 920 MHz to 1 930 MHz. PWT-E is an extension into the licensed bands 1 850 MHz to 1 910 MHz and 1 930 MHz to 1 990 MHz. PWT may also be allowed in some Latin American countries.

A.3.2 The ISM bands

Standard DECT can, since May 2002, also be applied in the US within the ISM bands 902 MHz to 928 MHz, 2 400 MHz to 2 483,5 MHz and 5 725 MHz to 5 850 MHz [30] and EN 300 175-2 [2].

The IMS bands are however unprotected. Opposite to a protected DECT spectrum, or the protected UPCS spectrum, having rules for uncoordinated compatible technology (DECT) installations, the ISM bands allow for uncoordinated usage of a variety of incompatible communication devices and also industrial, scientific and medical devices. Therefore maintenance of high quality of service will not be guaranteed when other types of ISM devices (non-DECT devices) are used in the same local area. This applies especially to voice and video services, but is less critical for best effort packet data services, where non-time-critical retransmissions are applied. The band 902 MHz to 928 MHz could be preferred over the 2 400 MHz to 2 483,5 MHz band due to lack of potential interference from IEEE 802.11b WLANs, microwave ovens and Bluetooth devices. The 900 MHz spectrum provides better range than the 2,4 GHz spectrum.

Annex B (informative): Bibliography

ETSI TR 101 310: "Digital Enhanced Cordless Telecommunications (DECT); Traffic capacity and spectrum requirements for multi-system and multi-service DECT applications co-existing in a common frequency band".

ETSI ETR 246: "Digital Enhanced Cordless Telecommunications (DECT); Application of DECT Wireless Relay Stations (WRS)".

ETSI TR 102 010: "Digital Enhanced Cordless Telecommunications (DECT); DECT access to IP networks".

ETSI TR 102 185: "Digital Enhanced Cordless Telecommunications (DECT); Data Services Profile (DSP); Profile overview".

ETSI TR 101 370: "Digital Enhanced Cordless Telecommunications (DECT); Implementing DECT Fixed Wireless Access (FWA) in an arbitrary spectrum allocation".

ETSI ETR 341: "Digital Enhanced Cordless Telecommunications (DECT); Global System for Mobile communications (GSM); DECT/GSM Interworking Profile (IWP); Profile overview".

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IEEE 802.11b: "Working Group for Wireless Area Networks (WLANs)".

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