



Digital Enhanced Cordless Telecommunications (DECT); DECT Technology Roadmap

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Foreword

This Technical Report (TR) has been produced by ETSI Technical Committee Digital Enhanced Cordless Telecommunications (DECT).

Modal verbs terminology

In the present document "**should**", "**should not**", "**may**", "**need not**", "**will**", "**will not**", "**can**" and "**cannot**" are to be interpreted as described in clause 3.2 of the [ETSI Drafting Rules](#) (Verbal forms for the expression of provisions).

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1 Scope

The present document gives a brief overview and history of the DECT standards, followed by current and future standardization activities, and a roadmap for the short-to-medium term for the DECT technology.

2 References

2.1 Normative references

Normative references are not applicable in the present document.

2.2 Informative references

References are either specific (identified by date of publication and/or edition number or version number) or non-specific. For specific references, only the cited version applies. For non-specific references, the latest version of the referenced document (including any amendments) applies.

NOTE: While any hyperlinks included in this clause were valid at the time of publication ETSI cannot guarantee their long term validity.

The following referenced documents are not necessary for the application of the present document but they assist the user with regard to a particular subject area.

- [i.1] ETSI EN 300 175-1: "Digital Enhanced Cordless Telecommunications (DECT); Common Interface (CI); Part 1: Overview".
- [i.2] ETSI EN 300 175-2: "Digital Enhanced Cordless Telecommunications (DECT); Common Interface (CI); Part 2: Physical Layer (PHL)".
- [i.3] ETSI EN 300 175-3: "Digital Enhanced Cordless Telecommunications (DECT); Common Interface (CI); Part 3: Medium Access Control (MAC) layer".
- [i.4] ETSI EN 300 175-4: "Digital Enhanced Cordless Telecommunications (DECT); Common Interface (CI); Part 4: Data Link Control (DLC) layer".
- [i.5] ETSI EN 300 175-5: "Digital Enhanced Cordless Telecommunications (DECT); Common Interface (CI); Part 5: Network (NWK) layer".
- [i.6] ETSI EN 300 175-6: "Digital Enhanced Cordless Telecommunications (DECT); Common Interface (CI); Part 6: Identities and addressing".
- [i.7] ETSI EN 300 175-7: "Digital Enhanced Cordless Telecommunications (DECT); Common Interface (CI); Part 7: Security features".
- [i.8] ETSI EN 300 175-8: "Digital Enhanced Cordless Telecommunications (DECT); Common Interface (CI); Part 8: Speech and audio coding and transmission".
- [i.9] ETSI EN 300 444: "Digital Enhanced Cordless Telecommunications (DECT); Generic Access Profile (GAP)".
- [i.10] ETSI TS 102 497: "Digital Enhanced Cordless Telecommunications (DECT); DECT in the 1 920 MHz to 1 930 MHz Unlicensed Personal Communications Services (UPCS) frequency band; Specific requirements".
- [i.11] ETSI TS 102 527-1: "Digital Enhanced Cordless Telecommunications (DECT); New Generation DECT; Part 1: Wideband Speech".
- [i.12] ETSI TS 102 527-2: "Digital Enhanced Cordless Telecommunications (DECT); New Generation DECT; Part 2: Support of transparent IP packet data".

- [i.13] ETSI TS 102 527-3: "Digital Enhanced Cordless Telecommunications (DECT); New Generation DECT; Part 3: Extended wideband speech services".
- [i.14] ETSI TS 102 527-4: "Digital Enhanced Cordless Telecommunications (DECT); New Generation DECT; Part 4: Light Data Services; Software Update Over The Air (SUOTA), content downloading and HTTP based applications".
- [i.15] ETSI TS 102 527-5: " Digital Enhanced Cordless Telecommunications (DECT); New Generation DECT; Part 5: Additional feature set nr. 1 for extended wideband speech services".
- [i.16] ETSI TS 102 939-1: "Digital Enhanced Cordless Telecommunications (DECT); Ultra Low Energy (ULE); Machine to Machine Communications; Part 1: Home Automation Network (phase 1)".
- [i.17] ETSI TS 102 939-2: "Digital Enhanced Cordless Telecommunications (DECT); Ultra Low Energy (ULE); Machine to Machine Communications; Part 2: Home Automation Network (phase 2)".
- [i.18] ETSI TR 103 422: "Digital Enhanced Cordless Telecommunications (DECT); DECT evolution technical study; Requirements and technical analysis for the further evolution of DECT and DECT ULE".
- [i.19] Recommendation ITU-R M.2410-0: "Minimum requirements related to technical performance for IMT-2020 radio interface(s)".
- [i.20] ETSI TR 103 514: "Digital Enhanced Cordless Telecommunications (DECT); DECT-2020 New Radio (NR) interface; Study on Physical (PHY) layer".
- [i.21] ETSI TR 102 185: "Digital Enhanced Cordless Telecommunications (DECT); Data Services Profile (DSP); Profile overview".
- [i.22] ETSI 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".
- [i.23] ETSI EN 301 239: "Digital Enhanced Cordless Telecommunications (DECT); Data Services Profile (DSP); Isochronous data bearer services for closed user groups (service type D, mobility class 1)".
- [i.24] ETSI EN 301 238: "Digital Enhanced Cordless Telecommunications (DECT); Data Services Profile (DSP); Isochronous data bearer services with roaming mobility (service type D, mobility class 2)".
- [i.25] ETSI EN 301 649: "Digital Enhanced Cordless Telecommunications (DECT); DECT Packet Radio Service (DPRS)".
- [i.26] ETSI EN 301 908-10: "Electromagnetic compatibility and Radio spectrum Matters (ERM); Base Stations (BS), Repeaters and User Equipment (UE) for IMT-2000 Third-Generation cellular networks; Part 10: Harmonised Standard for IMT-2000, FDMA/TDMA (DECT) covering the essential requirements of article 3.2 of the Directive 2014/53/EU".
- [i.27] ETSI TR 103 635: "Digital Enhanced Cordless Telecommunications (DECT); DECT-2020 New Radio (NR) interface; Study on MAC and higher layers".
- [i.28] ETSI TR 103 637: "DECT-2020 radio interface; Stage 2: security architecture DECT-2020 radio interface; Stage 2: security architecture".
- [i.29] Directive 1999/5/EC of the European Parliament and of the Council on Radio Equipment and Telecommunications Terminal Equipment and the mutual recognition of their conformity.

3 Definition of terms, symbols and abbreviations

3.1 Terms

Void.

3.2 Symbols

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

N_{DBPS}	Number of Data Bits Per Symbol
N_{SS}	Number of Spatial Streams

3.3 Abbreviations

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

BPSK	Binary Phase Shift Keying
DECT	Digital Enhanced Cordless Telecommunications
DLC	Data Link Control
DPRS	DECT Packet Radio System
DSP	Data Services Profile
FB	Full-Band
FEC	Forward Error Correction
GAP	Generic Access Profile
GFSK	Gaussian Frequency Shift Keying
HARQ	Hybrid ARQ
IMT	International Mobile Telecommunications
IoT	Internet of Things
IP	Internet Protocol
LC3plus	Low Complexity Communication Codec plus
MAC	Medium Access Control
MCS	Modulation Coding Scheme
MIMO	Multiple Input Multiple Output
mMTC	Massive Machine-Type Communications
NB	Narrow-Band
NG-DECT	New Generation DECT
NWK	NetWorK
OFDM	Orthogonal Frequency-Division Multiplexing
PABX	Private Automatic Branch eXchange
PDU	Protocol Data Unit
PHL	PHysical Layer
PMSE	Programme-Making and Special Events
QAM	Quadrature Amplitude Modulation
QPSK	Quadrature Phase Shift Keying
RF	Radio Frequency
SUOTA	Software Upgrade Over The Air
SWB	Super-WideBand
TDMA	Time-Domain Multiple Access
ULE	Ultra Low Energy
UPCS	Unlicensed Personal Communications Service
URLLC	Ultra-Reliable Low Latency Communications
WB	Wide-Band
WLL	Wireless Local loop

4 Technology Roadmap

4.1 A Brief History of DECT Standards

Date	Milestone	Comments
1989 - 1992	Development of DECT base standards	<ul style="list-style-type: none"> The core standard, developed originally for cordless telephony products, later extended for other applications. Applications: <ul style="list-style-type: none"> Cordless telephony. Enterprise systems (PABX). Public access telephony. Wireless Local Loop (WLL). Etc. Main standards: <ul style="list-style-type: none"> ETSI EN 300 175 parts 1 [i.1] to 8 [i.8]. Spectrum: <ul style="list-style-type: none"> 1 880 MHz - 1 900 MHz band in Europe. Other bands possible worldwide.
1995	Release of Generic Access Profile (GAP) standard	<ul style="list-style-type: none"> Generic Access Profile (GAP) standard defines a comprehensive feature set for interoperability of cordless telephony devices. Standard: ETSI EN 300 444 [i.9].
1995 - 2000 (approx.)	Data Services Profile (DSP)	<ul style="list-style-type: none"> A range of DECT Data Service Profiles for different services and applications. Main standards: <ul style="list-style-type: none"> ETSI TR 102 185 [i.21]. ETSI EN 301 240 [i.22]. ETSI EN 301 239 [i.23]. ETSI EN 301 238 [i.24]. Etc.
2000	DECT Packet Radio Service (DPRS) standard	<ul style="list-style-type: none"> The DPRS standard defines a features and services at MAC, DLC and NWK layer for data services. Standard: ETSI EN 301 649 [i.25].
2002	DECT Harmonised Standard for IMT-2000	<ul style="list-style-type: none"> Harmonised EN for IMT-2000, FDMA/TDMA (DECT) covering essential requirements of article 3.2 of the "R&TTE Directive [i.29]". Standard: <ul style="list-style-type: none"> ETSI EN 301 908-10 [i.26].
2005	Launch of "DECT 6.0" for North American markets	<ul style="list-style-type: none"> Marketing term for DECT devices intended for operation in North America (USA and Canada). Standard: <ul style="list-style-type: none"> ETSI TS 102 497 [i.10]. Spectrum: <ul style="list-style-type: none"> 1 920 MHz - 1 930 MHz UPCS band in North America
2007 - 2014	Development of "New Generation DECT" (NG-DECT) standards	<ul style="list-style-type: none"> Extends the basic DECT standards to cover wideband and super-wideband audio, and mandatory interoperability features. Also includes security enhancements and Software Upgrade Over The Air (SUOTA). Applications: <ul style="list-style-type: none"> Wideband cordless telephony. Wideband cordless headsets. Etc. Standards: <ul style="list-style-type: none"> ETSI TS 102 527 parts 1 [i.11] to 5 [i.15].

Date	Milestone	Comments
2013 - 2015	Development of "DECT Ultra Low Energy" (ULE) standards	<ul style="list-style-type: none"> Enhances DECT to allow ultra-low energy operation suitable for Internet Of Things (IoT), Home Automation and Home Security. Applications: <ul style="list-style-type: none"> Wireless security sensors. Wireless smoke/fire detectors. Wireless room temperature sensors. Wireless actuators. Wireless "smart plugs". Etc. Standards: <ul style="list-style-type: none"> ETSI TS 102 939 parts 1 [i.16] to 2 [i.17].

4.2 Standards Roadmap

Date	Milestone	Comments
2018-2019	Development of "DECT Evolution" standard	<ul style="list-style-type: none"> Evolves DECT standard by the implementation of a number of technical enhancements, whilst still using the DECT "classic" radio interface (Gaussian Frequency Shift Keying (GFSK)): <ul style="list-style-type: none"> Audio enhancements (new codecs, e.g. LC3plus). Low latency audio (< 10 ms). Enhanced support of advanced chipset features such as higher modulation rates and channel coding. Applications: <ul style="list-style-type: none"> Professional audio microphones and in-ear headsets, etc., for Programme-Making and Special Events (PMSE). Wireless Hi-Fi/audio equipment (e.g. wireless speakers, etc.). Standards: <ul style="list-style-type: none"> ETSI EN 300 175 parts 1 [i.1] to 8 [i.8] (due Q3 2019).
2019-2020	Enhancements for DECT Evolution	<ul style="list-style-type: none"> Additional work to further standardize high-rate asymmetric audio links. For example asymmetric audio: high bandwidth downlink/low bandwidth uplink; or low bandwidth downlink/high bandwidth uplink. Also, high fidelity, massive audio broadcast capability. Optimizations, e.g. allowing double simplex bearers without the need for dedicated duplex bearer (i.e. shared duplex bearer for control). Applications: <ul style="list-style-type: none"> Smart speakers/voice-assistants. Audio broadcast to multiple headsets (e.g. tour guide applications). Standards: <ul style="list-style-type: none"> TBD (due Q4 2020).