

# ETSI EN 300 175-1 V2.3.1 (2010-06)

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European Standard (Telecommunications series)

## Digital Enhanced Cordless Telecommunications (DECT); Common Interface (CI); Part 1: Overview

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## Foreword

This European Standard (Telecommunications series) has been produced by ETSI Technical Committee Digital Enhanced Cordless Telecommunications (DECT).

The present document is part 1 of a multi-part deliverable covering the Common Interface (CI) for the Digital Enhanced Cordless Telecommunications (DECT), as identified below:

**Part 1: "Overview";**

Part 2: "Physical Layer (PHL)";

Part 3: "Medium Access Control (MAC) layer";

Part 4: "Data Link Control (DLC) layer";

Part 5: "Network (NWK) layer";

Part 6: "Identities and addressing";

Part 7: "Security features";

Part 8: "Speech and audio coding and transmission".

The following aspects of the present document are subject to controlled distribution:

- a) DECT identities, as defined in EN 300 175-6 [6];
- b) DECT cryptographic algorithms.

The cryptographic algorithms specify the details of the DECT standard authentication algorithm and the DECT standard cipher.

These aspects are distributed on an individual basis. Further information and details of the current distribution procedures can be obtained from the ETSI Secretariat at the address on the second page of the present document.

Further details of the DECT system may be found in TR 101 178 [i.4], ETR 043 [i.5] and TR 102 185 [i.6].

### National transposition dates

Date of adoption of this EN:	7 June 2010
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Date of withdrawal of any conflicting National Standard (dow):	31 March 2011

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# 1 Scope

The present document gives an introduction and overview of the complete Digital Enhanced Cordless Telecommunications (DECT) Common Interface (CI).

The present document contains an abstract of the other parts of the DECT standard together with a general description of:

- the objectives of the present document;
- the DECT Common Interface;
- the protocol architecture of DECT.

The present document also provides an extensive vocabulary; in particular it contains the common definitions of all the technical terms used in different parts of the present document.

The present document includes New Generation DECT, a further development of the DECT standard introducing wideband speech, improved data services, new slot types and other technical enhancements.

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# 2 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 reference document (including any amendments) applies.

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

## 2.1 Normative references

The following referenced documents are necessary for the application of the present document.

- [1] Void.
- [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 and audio coding and transmission".

- [9] ETSI EN 300 176 (all parts): "Digital Enhanced Cordless Telecommunications (DECT); Test specification".
- [10] ITU-R Recommendation M.1457-6: "Detailed specifications of the radio interfaces of International Mobile Telecommunications-2000 (IMT-2000)".
- [11] ETSI EN 301 649: "Digital Enhanced Cordless Telecommunications (DECT); DECT Packet Radio Service (DPRS)".

## 2.2 Informative references

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 300 403-1: "Integrated Services Digital Network (ISDN); Digital Subscriber Signalling System No. one (DSS1) protocol; Signalling network layer for circuit-mode basic call control; Part 1: Protocol specification [ITU-T Recommendation Q.931 (1993), modified]".
- [i.2] ITU-R Recommendation SM.1046-2: "Definition of spectrum use and efficiency of a radio system".
- [i.3] ITU-R Recommendation M.816-1: "Framework for services supported on International Mobile Telecommunications-2000 (IMT-2000)".
- [i.4] ETSI TR 101 178: "Digital Enhanced Cordless Telecommunications (DECT); A High Level Guide to the DECT Standardization".
- [i.5] ETSI ETR 043: "Digital Enhanced Cordless Telecommunications (DECT); Common Interface (CI); Services and facilities requirements specification".
- [i.6] ETSI TR 102 185: "Digital Enhanced Cordless Telecommunications (DECT); Data Services Profile (DSP); Profile overview".
- [i.7] ETSI ETR 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".
- [i.8] ETSI TS 102 265: "Digital Enhanced Cordless Telecommunications (DECT); DECT access to IP networks".
- [i.9] ITU-T Recommendation P.311: "Transmission characteristics for wideband (150-7000 Hz) digital handset telephones".

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## 3 Definitions, symbols and abbreviations

### 3.1 Definitions

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

**Access Rights Class (ARC):** type of access to a DECT network, such as public, residential or private

**Access Rights Details (ARD):** unique number within one ARC

**Access Rights Identity (ARI):** globally unique identity that shows the access rights related to a service provider

NOTE: PARI = Primary ARI;  
SARI = Secondary ARI;  
TARI = Tertiary ARI.

**algorithm:** mathematical process or function that transforms an input into an output

**algorithm identifier:** designator to show which algorithm is in use, so that the correct one may be chosen

**antenna diversity:** diversity implies that the Radio Fixed Part (RFP) for each bearer independently can select different antenna properties such as gain, polarization, coverage patterns and other features that may effect the practical coverage

NOTE: A typical example is space diversity, provided by two vertically polarized antennas separated by 10 cm to 20 cm.

**asymmetric algorithm:** See public key algorithm.

**attach:** process whereby a Portable Part (PP) within the coverage area of a Fixed Part (FP) to which it has access rights, notifies the FP that it is operative

**authentication:** corroboration that an entity is the one that is claimed

**authentication of Fixed radio Termination (FT):** process whereby the identity of an FT is verified to a DECT PT

**authentication of Portable radio Termination (PT):** process whereby a DECT PT is positively verified to be a legitimate user of a particular FP

**authentication (of a subscriber):** process whereby a DECT subscriber is positively verified to be a legitimate user of a particular FP

**authentication of user:** process whereby a DECT user is positively verified to be a legitimate user of a particular FP

**bearer:** See Medium Access Control (MAC) bearer or bearer service.

**bearer handover:** internal handover process provided by the MAC layer, whereby one MAC connection can modify its underlying bearers while maintaining the service provided to the Data Link Control (DLC) layer

**bearer service:** type of telecommunication service that provides a defined capability for the transmission of signals between user-network interfaces

**broadcast:** simplex point-to-multipoint mode of transmission

**C-plane:** control plane of the DECT protocol stacks, which contains all of the internal DECT protocol control, but may also include some external user information

**call:** all of the Network (NWK) layer processes involved in one NWK layer peer-to-peer association

**cell:** domain served by a single antenna(e) system (including a leaky feeder) of one FP

**Central Control Fixed Part (CCFP):** physical grouping that contains the central elements of a FP

**centrex:** implementation of a private telecommunication network exchange that is not located on the premises of the private network operator

**Cipher Key (CK):** value that is used to determine the transformation of plaintext to ciphertext in a cryptographic algorithm

**Cipher Key (CK) generation:** process for generating cryptographic keys

**ciphertext:** output of a cryptographic algorithm

**channel:** See physical channel.

**cluster:** logical grouping of one or more cells between which bearer handover is possible

**confidentiality:** rendering information secret as ciphertext unless the capability is possessed to recover the plaintext from ciphertext

**connection:** See MAC connection.

**connection handover:** internal handover process provided by the DLC layer, whereby one set of DLC entities (C-plane and U-plane) can re-route data from one MAC connection to a second new MAC connection, while maintaining the service provided to the NWK layer

**ConnectionLess mode (C/L):** transmission mode that transfers one packet (one self contained unit) of data from one source point to one (or more) destination points in a single phase

**Connection Oriented mode (C/O):** transmission mode that transfers data from one source point to one or more destination points using a protocol based on three phases:

- "Set-up";
- "Data transfer"; and
- "Release".

**Cordless Radio Fixed Part (CRFP):** Wireless Relay Station (WRS) that provides independent bearer control to a PT and FT for relayed connections

**countermeasure:** device, instrument or procedure used to counteract or defend against a threat

**coverage area:** area over which reliable communication can be established and maintained

**cryptography:** secret writing

**Data Encryption Standard (DES):** United States Federal data encryption standard

**Data Link Control (DLC):** layer 2b of the DECT protocol stack

**decipherment:** rendering of ciphertext into plaintext

**DECT NetWork (DNW):** network that uses the DECT air interface to interconnect a local network to one or more portable applications

**DECT Standard Authentication Algorithm (DSAA):** algorithm used for authentication in DECT

**DECT Standard Cipher (DSC):** algorithm used for data encryption in DECT

**Derived Cipher Key (DCK):** Cipher Key (CK) that is established as part of the procedure used to authenticate the PT

**Default Cipher Key (DefCK):** Derived Cipher Key (DCK) that is stored in both FP and PP to be used later by MAC to immediately encrypt with connection establishment

**distributed communication:** ability of a DECT terminal to provide means for or assist direct communication between any two terminals, members of a "closed" local DECT network

**DLC broadband data link:** link that can be associated with a logical MAC connection comprising a number of MAC (physical) connections

**DLC broadcast:** simplex "connectionless" mode of transmission from the DLC broadcast entity of one FT to the DLC broadcast entities in one or more PT

**DLC data link (DLC link):** association between two DLC layer entities

**DLC frame:** format used to structure all messages that are exchanged between DLC layer peer entities

**double duplex bearer:** use of two duplex bearers (see duplex bearer) which refer to the same MAC connection, sharing their simplex bearers (see simplex bearer) for the information flow

**double-simplex bearer:** use of two simplex bearers operating in the same direction on two physical channels

**double slot:** one 12<sup>th</sup> of a TDMA frame which is used to support one high capacity physical channel

**down-link:** transmission in the direction FT to PT

**duplex bearer:** use of two simplex bearers operating in opposite directions on two physical channels

**encipherment:** rendering of plaintext into ciphertext

**End System (ES):** logical grouping that contains application processes and supports telecommunication services

**extended MAC control messages:** MAC messages of the B-field connection control set



**external handover:** process of switching a call in progress from one FP to another FP

**Fast Encryption Algorithm (FEAL algorithm):** particular encryption algorithm in the public domain

**field:** continuous region of data (i.e. adjacent bits) that jointly convey information

**fixed geometry Portable Part (PP):** PP in which the electro-acoustic transducers and their associated acoustic components are held in fixed relative positions and/or orientations during all on-line conditions and test conditions of the PP

**Fixed Part (DECT Fixed Part) (FP):** physical grouping that contains all of the elements in the DECT network between the local network and the DECT air interface

**Fixed radio Termination (FT):** logical group of functions that contains all of the DECT processes and procedures on the fixed side of the DECT air interface

**flow control:** mechanism that is used to regulate the flow of data between two peer entities

**fragment:** one of the Service Data Units (SDUs) that is produced by the process of fragmentation

**fragmentation:** process of dividing a Protocol Data Unit (PDU) into more than one SDU for delivery to a lower layer

**frame:** See TDMA frame or DLC frame.

**full slot (slot):** one 24<sup>th</sup> of a TDMA frame which is used to support one physical channel

**generic:** generalized set or general purpose set, often in the sense of basic or ordinary

**Generic Access Profile (GAP):** standard in addition to the DECT CI that ensures interoperability between FPs and PPs from different manufacturers

**geographically unique:** two FPs with the same PARI, or respectively two RFPs with the same RFPI, cannot be reached or listened to at the same geographical position

**Global NetWork (GNW):** telecommunication network capable of offering a long distance telecommunication service

**globally unique identity:** identity is unique within DECT (without geographical or other restrictions)

**guard space:** nominal interval between the end of a radio transmission in a given slot and the start of a radio transmission in the next successive slot

**half slot:** one 48<sup>th</sup> of a TDMA frame which is used to support one physical channel

**handover:** process of switching a call in progress from one physical channel to another physical channel

**handset echo:** echo, perceptible by the far-end user, resulting from the coupling between the receiving and sending directions of the handset, mostly due to acoustic coupling between transducers

**Headset PP (HPP):** headset PP is a wireless headset telephone using the DECT air interface

NOTE: A HPP usually has only one speaker and one microphone combined with a limited set of keys (e.g. call button, volume plus, and volume minus). Headsets provide the equivalent functionality of a PP with hands-free operation.

**Hybrid Part (HyP):** DECT terminal that provides FT as well as PT capabilities

**impersonation:** where one identity claims the part of another identity

**incoming call:** call received at a PP

**Integrated Services Digital Network (ISDN):** digital telecommunications infrastructure to the Consultative Committee on International Telegraphy and Telephony (CCITT) standards

**intercell handover:** switching of a call in progress from one cell to another cell

**internal call:** call between 2 users that does not make use of the local network resources

**internal handover:** handover processes that are completely internal to one FT

**International Portable User Identity (IPUI):** identity that uniquely defines one user within the domain defined by his access rights related to this IPUI

**interoperability:** capability of FPs and PPs, that enable a PP to obtain access to teleservices in more than one location area and/or from more than one operator (more than one service provider)

**interoperator roaming:** roaming between FP coverage areas of different operators (different service providers)

**InterWorking Unit (IWU):** unit that is used to interconnect subnetworks

**intracell handover:** switching of a call in progress from one physical channel of one cell to another physical channel of the same cell

**intraoperator roaming:** roaming between different FP coverage areas of the same operator (same service provider)

**isochronous:** essential characteristic of a time-scale or a signal such that the time intervals between consecutive significant instants either have the same duration or durations that are integral multiples of the shortest duration

**key management:** way in which cryptographic keys are generated, distributed and used

**Key Stream Generator (KSG):** cryptographic algorithm which produces a stream of binary digits which can be used for encipherment and decipherment

**link:** See DLC data link.

**Local Area Network (LAN):** electronic systems which are interconnected and in physical proximity to each other

**Local Network (LNW):** telecommunication network capable of offering local telecommunication services

**locally unique identity:** identity is unique within one FP or location area, depending on application

**location area:** domain in which a PP may receive (and/or make) calls as a result of a single location registration

**location registration:** process whereby the position of a DECT portable termination is determined to the level of one location area, and this position is updated in one or more databases

**logical channel:** generic term for any distinct data path

**logical connection:** association between two instances of the MAC MBC that can be used by higher layers to exchange U-plane or C-plane data

**Lower Layer Management Entity (LLME):** management entity that spans a number of lower layers, and is used to describe all control activities which do not follow the rules of layering

**Lower Tester (LT):** logical grouping that contains the test equipment, a functionally equivalent DECT PT, a functionally equivalent DECT FT and a test controller

**MAC bearer (bearer):** service element that is provided by each Cell Site Function (CSF)

**MAC connection (connection):** association between one source MAC Multi-Bearer Control (MBC) entity and one destination MAC MBC entity

**masquerading:** where one identity plays the part of, or acts as, another identity

**Medium Access Control (MAC):** layer 2a of the DECT protocol stack

**minimal MMS-message attributes:** message meta-information used in the request-to-send, etc.

**MMS-message attributes:** message meta-information

**mobility class 1:** local area applications, for which terminals are pre-registered off-air with one or more specific fixed parts, and establishment of service and user parameters is therefore implicit, according to a profile-defined list

**mobility class 2:** private and public roaming applications for which terminals may move between FPs within a given domain and for which association of service parameters is explicit at the time of service request

**multiframe:** repeating sequence of 16 successive TDMA frames, that allows low rate or sporadic information to be multiplexed (e.g. basic system information or paging)

**Multimedia Messaging Service:** generic set of commands, information elements and functionality for file/messaging service

**mutual authentication:** where two entities corroborate the identity of each other

**network (telecommunication network):** all the means of providing telecommunication services between a number of locations where the services are accessed via equipment attached to the network

**network echo:** echo, perceptible by the DECT user, resulting from reflections in the network. It is mostly due to hybrid impairments at both ends of the communication

**New Generation DECT:** further development of the DECT standard introducing wideband speech, improved data services, new slot types and other technical enhancements

**node:** point at which switching occurs

**operator (DECT operator):** individual or entity who or which is responsible for operation of one or more DECT FPs

**outgoing call:** call originating from a PP

**paging:** process of broadcasting a message from a DECT FP to one or more DECT PPs

**paging area:** domain in which the PP will be paged as a part of incoming call establishment

**PARK Length Indicator (PLI):** associates a group of FP ARIs to the PARK, by indicating how many of the first ARC + ARD bits are relevant

**Personal Identity Number (PIN):** short sequence of numbers (usually 4 to 8 digits) which may be used in an authentication process to prove identity

**phase:** one discrete part of a procedure, where the start and end of the part can be clearly identified (e.g. by the arrival or dispatch of a primitive)

**Physical (PHY):** layer 1 of the DECT protocol stack

**physical channel (channel):** simplex channel that is created by transmitting in one particular slot on one particular RF channel in successive TDMA frames

**plaintext:** information or data which is intelligible to everyone

**Portable Access Rights Key (PARK):** this states the access rights for a PP

**Portable Application (PA):** logical grouping that contains all the elements that lie beyond the DECT network boundary on the portable side

**Portable HandSet (PHS):** single physical grouping that contains all of the portable elements that are needed to provide a teleservice to the user

**Portable Part (DECT Portable Part) (PP):** physical grouping that contains all elements between the user and the DECT air interface

**Portable radio Termination (PT):** logical group of functions that contains all of the DECT processes and procedures on the portable side of the DECT air interface

**Portable User Number (PUN):** globally or locally unique number within one PUT

**Portable User Type (PUT):** this shows the numbering plan structure of a PUN

**Primary Access Rights Identity (PARI):** most frequently transmitted ARI

**primitive:** distinct (but abstract) data element that is passed between adjacent protocol layers

**private:** attribute indicating that the application of the so qualified term, e.g. a network, an equipment, a service, is offered to, or is in the interest of, a determined set of users