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

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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 Project Digital Enhanced Cordless Telecommunications (DECT).

The present document is part 1 of a multi-part EN 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 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 [4];
- 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 [7], ETR 043 [9] and ETR 185 [10].

National transposition dates	
Date of adoption of this EN:	16 February 2001
Date of latest announcement of this EN (doa):	31 May 2001
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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).

This part of the DECT CI 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.

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, edition number, version number, etc.) or non-specific.
- For a specific reference, subsequent revisions do not apply.
- For a non-specific reference, the latest version applies.

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- [1] ETSI EN 300 175-3: "Digital Enhanced Cordless Telecommunications (DECT); Common Interface (CI); Part 3: Medium Access Control (MAC) layer".
- [2] ETSI EN 300 175-4: "Digital Enhanced Cordless Telecommunications (DECT); Common Interface (CI); Part 4: Data Link Control (DLC) layer".
- [3] ETSI EN 300 175-5: "Digital Enhanced Cordless Telecommunications (DECT); Common Interface (CI); Part 5: Network (NWK) layer".
- [4] ETSI EN 300 175-6: "Digital Enhanced Cordless Telecommunications (DECT); Common Interface (CI); Part 6: Identities and addressing".
- [5] ETSI EN 300 175-8: "Digital Enhanced Cordless Telecommunications (DECT); Common Interface (CI); Part 8: Speech coding and transmission".
- [6] ETSI EN 300 176: "Digital Enhanced Cordless Telecommunications (DECT); Approval test specification".
- [7] ETSI TR 101 178: "Digital Enhanced Cordless Telecommunications (DECT); A High Level Guide to the DECT Standardization".
- [8] 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".
- [9] ETSI ETR 043: "Digital Enhanced Cordless Telecommunications (DECT); Common Interface (CI); Services and facilities requirements specification".
- [10] ETSI ETR 185: "Digital Enhanced Cordless Telecommunications (DECT); Data Services Profile (DSP); Profile overview".
- [11] 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]".

- [12] ITU-R Recommendation M.816-1: "Framework for services supported on International Mobile Telecommunications-2000 (IMT-2000)".
- [13] ITU-R Recommendation M.1457: "Detailed specifications of International Mobile Telecommunications-2000 (IMT-2000)".
- [14] ITU-T Recommendation X.25: "Interface between Data Terminal Equipment (DTE) and Data Circuit-terminating Equipment (DCE) for terminals operating in the packet mode and connected to public data networks by dedicated circuit".

3 Definitions and abbreviations

3.1 Definitions

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

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

Access Rights Details (ARD): this is a unique number within one ARC.

Access Rights Identity (ARI): this is, to a service provider, a globally unique identity that shows the access rights related to that service provider. The ARI consists of an ARC and an ARD. There are three categories of ARIs:

PARI = Primary ARI;

SARI = Secondary ARI;

TARI = Tertiary ARI.

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algorithm: mathematical process or function that transforms an input into an output. In cryptographic applications an algorithm is a process used for encipherment, decipherment or non-reversible encipherment under control of a key.

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

asymmetric algorithm: see public key algorithm.

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

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. The reverse process is detached, which reports the PP as inoperative.

NOTE 1: An operative PP is assumed to be ready to receive calls.

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

NOTE 2: Authentication is generally performed at call set-up, but may also be done at any other time (e.g. during a call).

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

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

authentication of FT: process whereby the identity of an FT is verified to a DECT PT.

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

NOTE 3: Authentication is generally performed at call setup, but may also be done at any other time (e.g. during a call).

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.

NOTE 4: Bearer handover is slot based.

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

NOTE 5: The DECT user-network interface corresponds to the top of the DECT network layer (layer 3).

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

NOTE 6: The transmitter may disregard the presence or absence of receivers.

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.

NOTE 7: The C-plane stack always contains protocol entities up to and including the network layer.

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

NOTE 8: Call may sometimes be used to refer to processes of all layers, since lower layer processes are implicitly required.

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

NOTE 9: A cell may include more than one source of radiated Radio Frequency (RF) energy (i.e. more than one radio end point).

Central Control Fixed Part (CCFP): physical grouping that contains the central elements of a FP. A FP contains a maximum of one CCFP.

NOTE 10: A CCFP controls one or more RFPs.

centrex: implementation of a private telecommunication network exchange that is not located on the premises of the private network operator. It may be co-located with, or physically a part of, a public exchange.

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. Ciphertext is not intelligible unless (in a reversible algorithm) the reverse transformation is performed.

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

channel: see physical channel.

cluster: logical grouping of one or more cells between which bearer handover is possible. A Cluster Control Function (CCF) controls one cluster.

NOTE 11: Internal handover to a cell which is not part of the same cluster can only be done by connection handover.

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.

NOTE 12: Connection handover is DLC frame based.

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.

NOTE 13: Connectionless transmissions require the peer-to-peer associations to be prearranged, and the transmission is unacknowledged at that layer.

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".

NOTE 14: C/O mode requires no prearranged associations between peer entities (unlike C/L mode).

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.

cryptography: literally secret writing. Used to describe the hiding of information.

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

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

DECT Network (DNW): network that uses the DECT air interface to interconnect a local network to one or more portable applications. The logical boundaries of the DECT network are defined to be at the top of the DECT NWK layer.

NOTE 15: A DNW is a logical grouping that contains one or more Fixed radio Terminations (FTs) plus their associated Portable radio Termination (PT). The boundaries of the DECT network are not physical boundaries.

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

decipherment: rendering of ciphertext into plaintext.

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

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

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.

NOTE 16: The transmitter may disregard the presence or absence of receivers.

DLC data link (DLC link): association between two DLC layer entities. This can either be one C-plane association or one U-plane association.

NOTE 17: This is not the same as a MAC connection.

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

NOTE 18: Different DLC frames are used in the C-plane and the U-plane, and there is more than one format of DLC frame in each plane.

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. These pairs of channels always use the same RF carrier and always use evenly spaced slots (i.e. separated by 0,5 Time Division Multiple Access (TDMA) frame).

A double-simplex bearer only exists as part of a multibearer MAC connection.

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

duplex bearer: use of two simplex bearers operating in opposite directions on two physical channels. These pairs of channels always use the same RF carrier and always use evenly spaced slots (i.e. separated by 0,5 TDMA frame).

double slot: one 12th of a TDMA frame which is used to support one high capacity physical channel.

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

NOTE 19: From the OSI point of view, end systems are considered as sources and sinks of information.

encipherment: rendering of plaintext into ciphertext.

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

Extended MAC control messages: MAC messages of the B-field connection control set.

FEAL algorithm: Fast Encryption Algorithm; a particular encryption algorithm in the public domain.

field: continuous region of data (i.e. adjacent bits) that jointly convey information. Typically, a message will contain several fields. If data is not continuous then it is defined as two (or more) fields.

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.

NOTE 20: A DECT FP contains the logical elements of at least one FT, plus additional implementation specific elements.

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.

NOTE 21: A FT only includes elements that are defined in EN 300 175 parts 1 to 8. This includes radio transmission elements (layer 1) together with a selection of layer 2 and layer 3 elements.

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.

NOTE 22: This is not the same as a segment.

fragmentation: process of dividing a Protocol Data Unit (PDU) into more than one SDU for delivery to a lower layer. The reverse process is recombination.

NOTE 23: This is not the same as segmentation.

frame: see TDMA frame or DLC frame.

full slot (slot): one 24th of a TDMA frame which is used to support one physical channel.

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

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

geographically unique: this term relates to FP identities, Primary Access Rights Identifiers (PARIs) and Radio Fixed Part Identifiers (RFPIs). It indicates that two FPs with the same PARI, or respectively two RFPIs with the same RFPI, can not be reached or listened to at the same geographical position.

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

NOTE 24: The term does not include legal or regulatory aspects, nor does it indicate if the network is a public or a private network.

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.

NOTE 25: This interval is included at the end of every slot, in order to prevent adjacent transmissions from overlapping even when they originate with slightly different timing references (e.g. from different radio end points).

half slot: one 48th 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. These processes can be internal (see internal handover) or external (see external handover).

NOTE 26: There are two physical forms of handover, intracell handover and intercell handover. Intracell handover is always internal, intercell handover can be internal or external.

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. It is particularly objectionable in communications including a satellite and an echo canceller, as the DECT handset echo may be out of range of the echo canceller.

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

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

incoming call: call received at a PP.

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. Internal handover reconnects the call at the lower layers, while maintaining the call at the NWK layer.

NOTE 27: The lower layer reconnection can either be at the DLC layer (see connection handover) or at the MAC layer (see bearer handover).

International Portable User Identity (IPUI): this is an identity that uniquely defines one user within the domain defined by his access rights related to this IPUI. The IPUI consists of a Portable User Type (PUT) and a Portable User Number (PUN).

NOTE 28: The IPUI may be locally unique or globally unique depending on type of PUT.

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.

NOTE 29: The IWU will contain the InterWorking Functions (IWF) necessary to support the required subnetwork interworking.

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 (ITU-T Recommendation R.140: "Definition of essential terms in the field of Telegraph transmission", definition 6014).

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.