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Digital Enhanced Cordless Telecommunications (DECT)
and Integrated Services Digital Network (ISDN) interworking
for end system configuration;
Part 2: Access profile

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Foreword

This European Telecommunication Standard (ETS) has been produced by the Radio Equipment and Systems (RES) Technical Committee of the European Telecommunications Standards Institute (ETSI).

Further details of the DECT system may be found in ETR 015, ETR 043 and ETR 056 (see annex A).

This ETS consists of two parts as follows:

Part 1:   "Interworking specification".

Part 2:   "Access profile".

Transposition dates	
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1 Scope

This European Telecommunication Standard (ETS), part of the Integrated Services Digital Network (ISDN) Digital Enhanced Cordless Telecommunications (DECT) interworking profile, specifies the set of technical requirements for DECT Fixed Parts (FPs) and Portable Parts (PPs) necessary for the support of the ISDN-DECT Access Service (IAS).

Apparatus claiming interoperability based upon this IAP has to fully comply with the process mandatory technical requirements, and those for optional features so far as they are provided for in this ETS.

2 Normative references

This ETS incorporates, by dated or undated reference, provisions from other publications. These normative references are cited at the appropriate places in the text and the publications are listed hereafter. For dated references, subsequent amendments to or revisions of any of these publications apply to this only when incorporated in it by amendment or revision. For undated references, the latest edition of the publication referred to applies.

[1]	ETS 300 175-1: "Radio Equipment and Systems (RES); Digital European Cordless Telecommunications (DECT); Common Interface (CI); Part 1: Overview".
[2]	ETS 300 175-2: "Radio Equipment and Systems (RES); Digital European Cordless Telecommunications (DECT); Common Interface (CI); Part 2: Physical Layer".
[3]	ETS 300 175-3: "Radio Equipment and Systems (RES); Digital European Cordless Telecommunications (DECT); Common Interface (CI); Part 3: Medium Access Control (MAC) layer".
[4]	ETS 300 175-4: "Radio Equipment and Systems (RES); Digital European Cordless Telecommunications (DECT); Common Interface (CI); Part 4: Data Link Control (DLC) layer".
[5]	ETS 300 175-5: "Radio Equipment and Systems (RES); Digital European Cordless Telecommunications (DECT); Common Interface (CI); Part 5: Network (NWK) layer".
[6]	ETS 300 175-6: "Radio Equipment and Systems (RES); Digital European Cordless Telecommunications (DECT); Common Interface (CI); Part 6: Identities and addressing".
[7]	ETS 300 175-7: "Radio Equipment and Systems (RES); Digital European Cordless Telecommunications (DECT); Common Interface (CI); Part 7: Security features".
[8]	ETS 300 175-8: "Radio Equipment and Systems (RES); Digital European Cordless Telecommunications (DECT); Common Interface (CI); Part 8: Speech coding and transmission".
[9]	ETS 300 175-9: "Radio Equipment and Systems (RES); Digital European Cordless Telecommunications (DECT); Common Interface (CI); Part 9: Public Access Profile (PAP)".
[10]	CCITT Recommendation G.726 (1988): "40, 32, 24, 16 kbit/s adaptive differential pulse code modulation (ADPCM)".
[11]	I-ETS 300 176: "Radio Equipment and Systems (RES); Digital European Cordless Telecommunications (DECT); Approval test specification".

[12]   ETS 300 434-1: "Radio Equipment and Systems (RES); Digital European Cordless Telecommunications (DECT) and Integrated Services Digital Network (ISDN) interworking for end system configuration - Part 1: Interworking specification".

3   Definitions and abbreviations

3.1   Definitions

For the purpose of this ETS, the following definitions apply:

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

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

C-plane: The 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 1:   The C-plane stack always contains protocol entities up to and including the Network (NWK) layer.

call: All of the NWK layer processes involved in one NWK layer peer-to-peer association.

> NOTE 2:   Call may sometimes be used to refer to processes of all layers, since lower layer processes are implicitly required.

DECT Fixed System (DFS): A logical grouping that contains all the functions between the DECT D reference point and the reference point on the fixed side of the DECT air interface.

> NOTE 3:   The DECT Fixed System (DFS) = FT + (local network up to the fixed side ISDN reference point (including fixed side IWU)).

DECT Network (DNW): A 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 4:   A DNW is a logical grouping that contains one or more fixed radio terminations plus their associated PT. The boundaries of the DECT network are not physical boundaries.

DECT Portable System (DPS): A logical grouping that contains all the functions between the DECT D reference point and the user interface on the portable side of the DECT air interface.

> NOTE 5:   The DPS = PT + (Portable Application (PA)).

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

> NOTE 6:   From the OSI point of view, end systems are considered as sources and sinks of information.

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

> NOTE 7:   A DECT FP contains the logical elements of at least one FT, plus additional implementation specific elements.

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

> NOTE 8:   A FT only includes elements that are defined in the DECT CI standard. This includes radio transmission elements together with a selection of layer 2 and layer 3 elements.

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

> NOTE 9: The term does not include legal or regulatory aspects, neither does it indicate if the network is a public or a private network.

incoming call: A call received at a PP.

inter-operability: The 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).

Interworking Unit (IWU): A unit that is used to interconnect sub-networks.

> NOTE 10: The IWU contains the interworking functions necessary to support the required sub-network interworking.

ISDN Access Profile (IAP): A defined part of the DECT/ISDN interworking standard that ensures inter-operability between FPs and PPs for the access of ISDN services.

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

> NOTE 11: The term does not include legal or regulatory aspects, nor does it indicate if the network is a public network or a private network.

MAC Connection (CONNECTION): An association between one source MAC Multi-Bearer Control (MBC) entity and one destination MAC MBC entity. This provides a set of related MAC services (a set of logical channels), and it can involve one or more underlying MAC bearers.

outgoing call: A call originating from a PP.

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

> NOTE 12: Different types of paging message are possible. For example, the {LCE_REQUEST-PAGE} message orders the recipient to respond with a call set-up attempt.

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

> NOTE 13: The functions contained in the portable application may be physically distributed, but any such distribution is invisible to the DECT network.

Portable Part (DECT Portable Part) (PP): A physical grouping that contains all elements between the user and the DECT air interface. PP is a generic term that may describe one or several physical pieces.

> NOTE 14: A DECT PP is logically divided into one PT plus one or more PAs.

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

> NOTE 15: A PT only includes elements that are defined in the DECT CI standard. This includes radio transmission elements (layer 1) together with a selection of layer 2 and layer 3 elements.

Public Access Profile (PAP): A defined part of the DECT Common Interface (DECT CI) standard that ensures inter-operability between FPs and PPs for public access services.

Radio Fixed Part (RFP): One physical sub-group of a FP that contains all the radio end points (one or more) that are connected to a single system of antennas.

segment: One of the pieces of data that is produced by the process of segmentation.

>   NOTE 16:   In general, one segment only represents a portion of a complete message.

segmentation: The process of partitioning one Service Data Unit (SDU) from a higher layer into more than one Protocol Data Unit (PDU). The reverse process is assembly.

supplementary service: A service that modifies or supplements a basic telecommunication service.

teleservice: A type of telecommunication service that provides the complete capability, including terminal equipment functions, for communication between users, according to protocols that are established by agreement.

U-plane: The user plane of the DECT protocol stacks. This plane contains most of the end-to-end (external) user information and user control.

>   NOTE 17:   The U-plane protocols do not include any internal DECT protocol control, and it may be null at the NWK layer and at the DLC layers for some services.

3.2   DECT abbreviations and acronyms

For the purposes of this ETS, the following DECT abbreviations and acronyms apply:

3PTY	Three party
AOC	Advice Of Charge
CCBS	Completion of Calls to Busy Subscriber
CC	Call Control
CCITT	(The) International Telegraph and Telephone Consultative Committee
CD	Call Deflection
CF	Call Forwarding (supplementary service)
HOLD	Call HOLD
CI	Common Interface
CISS	Call Independent Supplementary Services
CLIP	Calling Line Identification Presentation
CLIR	Calling Line Identification Restriction
COLP	COnnected Line Identification Presentation
COLR	COnnected Line Identification Restriction
CONF	CONference call, add-on
CLMS	ConnectionLess Message Service
CLSS	ConnectionLess Supplementary Service
COMS	Connection Oriented Message Service
CRSS	Call Related Supplementary Services
C/L	ConnectionLess mode
C/O	Connection Oriented mode
CUG	Closed User Group
CW	Call Waiting
D	DECT reference point for end system
DDI	Direct Dialling In
DECT	Digital Enhanced Cordless Telecommunication
DFS	DECT Fixed System
DLC	Data Link Control
DPS	DECT Portable System
DTMF	Dual Tone Multi-Frequency
FIFO	First-In-First-Out
FP	Fixed Part
FPH	Free Phone
FT	Fixed radio Termination
GAP	Generic Access Profile
IAP	ISDN Access Profile
IWU	InterWorking Unit
LCE	Link Control Entity
LLME	Lower Layer Management Entity
MAC	Medium Access Control

MCID	Malicious Call IDentification
MM	Mobility Management
MMC	Meet-Me Conference
MSN	Multiple Subscriber Number
NWK	Network
PAP	Public Access Profile
PDU	Protocol Data Unit
PBX	Private Branch eXchange
PABX	Private Automatic Branch eXchange
PP	Portable Part
PSTN	Public Switched Telephone Network
PT	Portable radio Termination
REP	Radio End Point
RFP	Radio Fixed Part
RFPI	Radio Fixed Part Identity
SAP	Service Access Point
SUB	SUBaddressing
SDU	Service Data Unit
TI	Transaction Identifier
UUS	User-to-User Signalling
UUS1	UUS service 1
UUS2	UUS service 2
UUS3	UUS service 3

3.3 ISDN abbreviations and acronyms

For the purpose of this ETS, the following ISDN abbreviations and acronyms apply:

BRA	Basic Rate Access
C	C reference point
ISDN	Integrated Services Digital Network
NT1	Network Termination 1
NT2	Network Termination 2
P	P reference point
PRA	Primary Rate Access
R	R reference point
S	S reference point
S/T	S/T reference point
T	T reference point
TA	Terminal Adapter
TE1	ISDN terminal
TE2	non ISDN terminal
vBRA	Virtual Basic Rate Access
SS	Supplementary Services

4 Features for the ISDN-DECT access service

4.1 Description of the features

4.1.1 Outgoing call (feature 0)

A call originated at the DECT PP.

4.1.2 Speech (feature 1)

Circuit-mode 32 kbit/s unrestricted 8 kHz structured bearer service category suitable for speech information transfer (see CCITT Recommendation G.726 [10]).

4.1.3 Off-hook (feature 4)

The ability to indicate the action of going off-hook, e.g. to start call set-up or accept a call.

4.1.4 On-hook - full release (feature 5)

The ability to indicate the action of going on-hook (e.g. to terminate a call) and fully release the radio resource.

4.1.5 Dialled digits - basic (feature 7)

The capability to dial digits 0 - 9, *, #.

4.1.6 Dialled digits - additional (feature 8)

The capability to dial digits A, B, C, D (in addition to the basic digits).

4.1.7 Dialling delimiter (feature 9)

A means to generate or otherwise to indicate "end-of-destination-address" when dialling or transmitting dialled digits.

4.1.8 Incoming call (feature 16)

A call received at a DECT PP.

4.1.9 Control of supervisory tones (feature 26)

For the ISDN-DECT access service, network supervisory signals shall be made available in-band to the PP by the FP, either by relay from the global or extended services network, or by local generation at the PP.

The provision of a tone generator is optional for ISDN-DECT access service PPs.

4.1.10 Signalling of display characters (feature 28)

The transmission to the PP of characters to be displayed on the user's PP display (if provided).

4.1.11 Selection of required teleservice (feature 52)

The ability to select a particular teleservice which is required at a given moment.

4.1.12 Selection of bearer service (feature 53)

The ability to select a particular bearer service for a particular application for the duration or part of the duration of an individual call.

4.1.13 Voice band data capability (feature 60)

The ability to support the 3,1 kHz audio bearer service.

4.1.14 Keypad protocol for supplementary services (feature 61)

A protocol used to invoke supplementary services offered by the network to which DECT is interconnected.

4.1.15 64 kbit/s unrestricted digital information (feature 75)

The ability to transmit and receive 64 kbit/s unrestricted digital data over a communications channel.

4.1.16 Overlap sending - outgoing call (feature 77)

The ability to send dialling information after the outgoing call request set-up message is sent.

4.1.17 Functional supplementary service Calling Line Identification Presentation (CLIP) (feature 101)

The ability to support the functional supplementary service CLIP.

4.1.18 Functional supplementary service Calling Line Identification Restriction (CLIR) (feature 102)

The ability to support the functional supplementary service CLIR.

4.1.19 Functional supplementary service COnnected Line Identification Presentation (COLP) (feature 103)

The ability to support the functional supplementary service COLP.

4.1.20 Functional supplementary service COnnected Line Identification Restriction (COLR) (feature 104)

The ability to support the functional supplementary service COLR.

4.1.21 Functional supplementary service Multiple Subscriber Number (MSN) (feature 105)

The ability to support the functional supplementary service MSN.

4.1.22 Functional supplementary service Direct Dialling In (DDI) (feature 106)

The ability to support the functional supplementary service DDI.

4.1.23 Functional supplementary service SUBaddressing (SUB) (feature 107)

The ability to support the functional supplementary service SUB.

4.1.24 Functional supplementary service Call Waiting (CW) (feature 108)

The ability to support the functional supplementary service CW.

4.1.25 Functional supplementary service HOLD (feature 109)

The ability to support the functional supplementary service HOLD.

4.1.26 Functional supplementary service Closed User Group (CUG) (feature 110)

The ability to support the functional supplementary service CUG.

4.1.27   Functional supplementary service Advice Of Charge (AOC) (feature 111)

The ability to support the functional supplementary service AOC.

4.1.28   Functional supplementary service Malicious Call IDentification (MCID) (feature 112)

The ability to support the functional supplementary service MCID.

4.1.29   Functional supplementary service CONference call, add-on (CONF) (feature 113)

The ability to support the functional supplementary service CONF.

4.1.30   Functional supplementary service Three party (3PTY) (feature 114)

The ability to support the functional supplementary service 3PTY.

4.1.31   Functional supplementary service Call Deflection (CD) (feature 115)

The ability to support the functional supplementary service CD.

4.1.32   Functional supplementary service UUS service 1 (UUS1) (feature 116)

The ability to support the functional supplementary service UUS1.

4.1.33   Functional supplementary service UUS service 2 (UUS2) (feature 117)

The ability to support the functional supplementary service UUS2.

4.1.34   Functional supplementary service UUS service 3 (UUS3) (feature 118)

The ability to support the functional supplementary service UUS3.

4.1.35   Functional supplementary service Explicit Call Transfer (ECT) (feature 119)

The ability to support the functional supplementary service ECT.

4.1.36   Functional supplementary service Completion of Calls to Busy Subscriber (CCBS) (feature 120)

The ability to support the functional supplementary service CCBS.

4.1.37   Functional supplementary service Free Phone (FPH) (feature 121)

The ability to support the functional supplementary service FPH.

4.1.38   Functional supplementary service Meet-Me Conference (MMC) (feature 122)

The ability to support the functional supplementary service MMC.

4.1.39   Functional supplementary service "Call Forwarding" (CF) (feature 123)

The ability to support the functional supplementary service "Call Forwarding".

5 Requirements regarding the Network (NWK) layer

See ETS 300 175-5 [5].

The minimum service shall only require the provision of a single instance of CC (one independent call).

The minimum ISDN-DECT access service shall not require the use of extended transaction identifiers (see ETS 300 175-5 [5], subclause 7.3). Extended transaction identifiers should not be used (even by equipment that supports their use).

> NOTE: Extended transaction identifiers may nonetheless be supported. If they are supported, the use of an extended transaction identifier by the peer entity should not of itself constitute an error.

5.1 Summary of features and related procedures

Those facilities listed below which are indicated as "provision mandatory" in either the PP, or FP, or both, represent the minimum ISDN-DECT access service feature set. The procedures associated to each feature are indicated in table 1.

Table 1

	Feature	Provision		Related
		FP	PP	Procedure(s)
0	Outgoing call	M	M	1,5,6,7,8,9,10,11,20b,21,72,75,78
1	Duplex speech - 32 kbit/s ADPC	C1	C1	ETS 300 175-8 [8]
4	Off hook	M	M	1
5	On hook (full release)	M	M	22,23,24,25
7	Dialled digits basic	M	M	
8	Dialled digits additional	O	O	
9	Dialling delimiter	O	O	
16	Incoming call	M	M	12,13,15,18,19,20a,21,73, 74,75,78
26	Control of supervisory tones	O	O	
28	Signalling of display characters	O	O	
52	Selection of required teleservice	O	O	
53	Selection of bearer service	C2	C2	
60	Voice band data capability	C1	C1	
61a	Keypad protocol - CRSS	O	O	33
75	64 kbit/s unrestricted digital information	C1	C1	92
77	Overlap sending - outgoing call	O	O	6
101	Functional supplementary service CLIP	O	O	101
102	Functional supplementary service CLIR	O	O	102
103	Functional supplementary service COLP	O	O	103
104	Functional supplementary service COLR	O	O	104
105	Functional supplementary service MSN	O	O	105
106	Functional supplementary service DDI	O	O	106
107	Functional supplementary service SUB	O	O	107
108	Functional supplementary service CW	O	O	108
109	Functional supplementary service HOLD	O	O	35,36,109
110	Functional supplementary service CUG	O	O	110
111	Functional supplementary service AOC	O	O	111
112	Functional supplementary service MCID	O	O	112
113	Functional supplementary service CONF	O	O	113
114	Functional supplementary service 3PTY	O	O	114
115	Functional supplementary service CD	O	O	115
116	Functional supplementary service UUS1	O	O	116

(continued)

Table 1 (concluded)

	Feature	Provision		Related
		FP	PP	Procedure(s)
117	Functional supplementary service UUS2	O	O	117
118	Functional supplementary service UUS3	O	O	118
119	Functional supplementary service ECT	O	O	119
120	Functional supplementary service CCBS	O	O	120
121	Functional supplementary service FPH	O	O	121
122	Functional supplementary service MMC	O	O	122
123	Functional supplementary service CF	O	O	123

M   mandatory;
O   optional;
C   conditional;
-    not applicable.

C1: At least one of these features speech, voice band data or 64 kbit/s data shall be implemented.
C2: If default is predefined then O ELSE M.

5.2   Procedures

Table 2 lists the procedures for the IAS. For each procedure, a provision status is given for the PT and FT. Also a reference to the DECT base standard is given for each of the procedures. The procedures which are indicated as mandatory represent the minimum IAS procedure set. All DECT base standard procedures not listed in the following table shall be considered out side the scope of the IAS.

The references in the table relate either to ETS 300 175-5 [5] or to ETS 300 434-1 [12]. The version of ETS 300 175-5 [5] from October 1992 does not contain the updates as specified in ETS 300 434-1 [12], annex A. Therefore ETS 300 434-1 [12], annex A applies in addition to ETS 300 175-5 [5] until an update of ETS 300 175-5 [5] is available.

Table 2

	Name of Procedure	Ref.	PT Status	FT Status
1	cc_outgoing_normal_call_request	ETS 300 175-5 [5], subclause 9.3.1.1	M	M
5	cc_outgoing_connection_of_U_plane	ETS 300 434-1 [12], subclause 6.4	M	M
6	cc_outgoing_overlap_sending	ETS 300 175-5 [5], subclause 9.3.1.5	C02	M
7	cc_outgoing_call_proceeding	ETS 300 175-5 [5], subclause 9.3.1.6	M	M
8	cc_outgoing_call_confirmation	ETS 300 175-5 [5], subclause 9.3.1.7	M	M
9	cc_outgoing_call_connection	ETS 300 175-5 [5], subclause 9.3.1.8	M	M
10	cc_expiry_of_timer_P<cc.03>	ETS 300 175-5 [5], subclause 9.3.1.2	M	M
11	cc_expiry_of_timer_P<cc.04>	ETS 300 175-5 [5], subclause 9.3.1.9	O	O
12	cc_incoming_call_accept	ETS 300 175-5 [5], subclause 9.3.2.2	M	M
13	cc_incoming_call_reject	ETS 300 175-5 [5], subclause 9.3.2.2	M	M

(continued)

Table 2 (continued)

	Name of Procedure	Ref.	PT Status	FT Status
15	cc_incoming_connection_of_U_plane	ETS 300 175-5 [5], subclause 9.3.2.4	M	M
18	cc_incoming_call_confirmation	ETS 300 175-5 [5], subclause 9.3.2.7	C01	M
19	cc_incoming_call_connection	ETS 300 175-5 [5], subclause 9.3.2.8	M	M
20_a	cc_incoming_pt_sending_terminal_capability	ETS 300 175-5 [5], subclause 9.3.2.9	O	M
20_b	cc_outgoing_pt_sending_terminal_capability	ETS 300 175-5 [5], subclause 9.3.1.1	O	M
21	cc_call_information	ETS 300 175-5 [5], subclause 9.4	O	O
22	cc_starting_side_normal_call_release	ETS 300 175-5 [5], subclause 9.5.1	M	M
23	cc_accepting_side_normal_call_release	ETS 300 175-5 [5], subclause 9.5.1	M	M
24	cc_abnormal_call_release	ETS 300 175-5 [5], subclause 9.5.2	M	M
25	cc_release_collisions	ETS 300 175-5 [5], subclause 9.5.3	M	M
33	crss_keypad_protocol	ETS 300 175-5 [5], subclause 10.2	O	O
35	crss_hold	ETS 300 175-5 [5], subclause 10.4.1	C12	C12
36	crss_retrieve	ETS 300 175-5 [5], subclause 10.4.1	C12	C12
72	lce_direct_pt_init_link_establishment	ETS 300 175-5 [5], subclause 14.2.2	M	M
73	lce_indirect_ft_init_link_establishment	ETS 300 175-5 [5], subclause 14.2.3	M	M
74	lce_direct_ft_init_link_establishment	ETS 300 175-5 [5], subclause 14.2.4	O	O
75	lce_link_maintenance	ETS 300 175-5 [5], subclause 14.2.5	M	M
78	lce_link_release	ETS 300 175-5 [5], subclause 14.2.7	M	M
92	LU7 DLC U-plane service	ETS 300 434-1 [12], annex B	C03	C03
101	fss_clip	ETS 300 434-1 [12], subclause 6.2.2.5.1	C04	C04
102	fss_clir	ETS 300 434-1 [12], subclause 6.2.2.5.2	C05	C05
103	fss_colp	ETS 300 434-1 [12], subclause 6.2.2.5.3	C06	C06
104	fss_colr	ETS 300 434-1 [12], subclause 6.2.2.5.4	C07	C07
105	fss_msn	ETS 300 434-1 [12], subclause 6.2.2.5.5	C08	C08
(continued)				

Table 2 (concluded)

	Name of Procedure	Ref.	PT Status	FT Status
106	fss_ddi	ETS 300 434-1 [12], subclause 6.2.2.5.6	C09	C09
107	fss_sub	ETS 300 434-1 [12], subclause 6.2.2.5.7	C10	C10
108	fss_cw	ETS 300 434-1 [12], subclause 6.2.2.5.9	C11	C11
109	fss_ch	ETS 300 434-1 [12], subclause 6.2.2.5.10	C12	C12
110	fss_cug	ETS 300 434-1 [12], subclause 6.2.2.5.11	C13	C13
111	fss_aoc	ETS 300 434-1 [12], subclause 6.2.2.5.12	C14	C14
112	fss_mcid	ETS 300 434-1 [12], subclause 6.2.2.5.13	C15	C15
113	fss_conf	ETS 300 434-1 [12], subclause 6.2.2.5.14	C16	C16
114	fss_3pty	ETS 300 434-1 [12], subclause 6.2.2.5.15	C17	C17
115	fss_cd	ETS 300 434-1 [12], subclause 6.2.2.5.16	C18	C18
116	fss_uus1	ETS 300 434-1 [12], subclause 6.2.2.5.17	C19	C19
117	fss_uus2	ETS 300 434-1 [12], subclause 6.2.2.5.18	C20	C20
118	fss_uus3	ETS 300 434-1 [12], subclause 6.2.2.5.19	C21	C21
119	fss_ect	ETS 300 434-1 [12], subclause 6.2.2.5.20	C22	C22
120	fss_ccbs	ETS 300 434-1 [12], subclause 6.2.2.5.21	C23	C23
121	fss_fph	ETS 300 434-1 [12], subclause 6.2.2.5.22	C24	C24
122	fss_mmc	ETS 300 434-1 [12], subclause 6.2.2.5.23	C25	C25
123	fss_cf	ETS 300 434-1 [12], subclause 6.2.2.5.24	C26	C26

M   mandatory;
O   optional;
C   conditional;
X   not allowed;
-    not applicable.

C01: IF Duplex speech (feature 1) or voice band data (feature 60) THEN M ELSE O
C02: IF Overlap sending (feature 77)THEN M ELSE O
C03: IF 64 kbit/s unrestricted digital information (feature 75) THEN M ELSE O
C04: IF functional supplementary service CLIP (feature 101) THEN M ELSE O
C05: IF functional supplementary service CLIR (feature 102) THEN M ELSE O
C06: IF functional supplementary service COLP (feature 103) THEN M ELSE O
C07: IF functional supplementary service COLR (feature 104) THEN M ELSE O
C08: IF functional supplementary service MSN (feature 105) THEN M ELSE O
C09: IF functional supplementary service DDI (feature 106) THEN M ELSE O
C10: IF functional supplementary service SUB (feature 107) THEN M ELSE O
C11: IF functional supplementary service CW (feature 108) THEN M ELSE O
C12: IF functional supplementary service HOLD (feature 109) THEN M ELSE O
C13: IF functional supplementary service CUG (feature 110) THEN M ELSE O
C14: IF functional supplementary service AOC (feature 111) THEN M ELSE O
C15: IF functional supplementary service MCID (feature 112) THEN M ELSE O
C16: IF functional supplementary service CONF (feature 113) THEN M ELSE O

C17: IF functional supplementary service 3PTY (feature 114) THEN M ELSE O
C18: IF functional supplementary service CD (feature 115) THEN M ELSE O
C19: IF functional supplementary service UUS1 (feature 116) THEN M ELSE O
C20: IF functional supplementary service UUS2 (feature 117) THEN M ELSE O
C21: IF functional supplementary service UUS3 (feature 118) THEN M ELSE O
C22: IF functional supplementary service ECT (feature 119) THEN M ELSE O
C23: IF functional supplementary service CCBS (feature 120) THEN M ELSE O
C24: IF functional supplementary service FPH (feature 121) THEN M ELSE O
C25: IF functional supplementary service MMC (feature 122) THEN M ELSE O
C26: IF functional supplementary service CF (feature 123) THEN M ELSE O

5.3 Mapping of the features onto the procedures

This subclause describes how the features that are defined in clause 4 are mapped onto the procedures. The provision of the feature itself can be optional, conditional or mandatory (as defined in subclause 5.1) but whenever a feature is provided, the mapping shall be as defined in this subclause.

> NOTE: The minimum set of ISDN-DECT access procedures is the set of procedures which are indicated as mandatory in the procedure table in subclause 5.2.

5.3.1 Outgoing call (feature 0)

This feature shall be implemented by the minimum set of ISDN-DECT access procedures.

5.3.2 Duplex speech (feature 1)

This feature is fully supported by the minimum set of ISDN-DECT access procedures and the procedures in ETS 300 175-8 [8].

5.3.3 Off-hook (feature 4)

This feature is fully supported by the minimum set of ISDN-DECT access procedures.

> NOTE: This feature is implicitly supported by the CC-procedures.

5.3.4 On-hook - full release (feature 5)

This feature is fully supported by the minimum set of ISDN-DECT access procedures.

> NOTE: This feature is implicitly supported by the CC-procedures.

5.3.5 Dialled digits - basic (feature 7)

This feature is fully supported by the minimum set of ISDN-DECT access procedures.

5.3.6 Dialled digits - additional (feature 8)

This feature shall be implemented by the minimum set of ISDN-DECT access procedures plus the following:

- the PT shall be able to send the <<multi-keypad>> information elements containing the DECT standard 8-bit character coding "a", "b", "c" and "d" and the FT shall be able to understand them;

- additional dialled digits shall only use the lower-case letters "a", "b", "c" and "d".

5.3.7 Dialling delimiter (feature 9)

This feature shall be implemented by the minimum set of ISDN-DECT access procedures plus the following:

- the PT shall be able to send the <<sending complete>> information element as specified in ETS 300 175-5 [5] and the FT shall be able to understand this information element.

5.3.8   Incoming call (feature 16)

This feature shall be implemented by the minimum set of ISDN-DECT access procedures plus the following:

-        the FT shall also support procedures 12, 13, 15, 18, 19, 21, 20a, and 73.

5.3.9   Control of supervisory tones (feature 26)

This feature shall be implemented by the minimum set of ISDN-DECT access procedures plus the following:

-        The FT shall be able to send the <<signal>> information element as specified in ETS 300 175 5 [5] and the PT shall be able to understand and react upon this information element.

5.3.10   Signalling of display characters (feature 28)

This feature shall be implemented by the minimum set of ISDN-DECT access procedures plus the following:

-        The FT shall be able to send <<multi-display>> information elements as specified in ETS 300 175-5 [5] and the PT shall be able to understand and react upon these information elements.

5.3.11   Selection of required teleservice (feature 52)

This feature is fully supported by the minimum set of ISDN-DECT access procedures.

        NOTE: The selection is done during the network layer CC call establishment. It is defined by sending the <<IWU to IWU>> information element containing the ISDN <<HLC>> information element.

5.3.12   Selection of bearer service (feature 53)

This feature is fully supported by the minimum set of ISDN-DECT access procedures.

        NOTE: The selection is done during the network layer CC call establishment.

5.3.13   Voice band data capability (feature 60)

This feature is fully supported by the minimum set of ISDN-DECT access procedures.

        NOTE: Voice band data capability means the support of the 3,1 kHz audio bearer service.

5.3.14   Keypad protocol for supplementary services - CRSS (feature 61a)

This feature shall be implemented by the minimum set of ISDN-DECT access procedures plus the following:

-        the FT and PT shall support the crss_keypad_protocol procedure (33).

5.3.15   64 kbit/s unrestricted digital information (feature 75)

This feature shall be implemented by the minimum set of ISDN-DECT access procedures plus the following:

-        the FT and PT shall support the DLC LU7 U-plane service (procedure 92).

5.3.16 Overlap sending - outgoing call (feature 77)

This feature shall be implemented by the minimum set of ISDN-DECT access procedures plus the following:

- the PT shall support the procedure cc_outgoing_overlap_sending (procedure 6).

5.3.17 Functional supplementary service CLIP (feature 101)

This feature shall be implemented by the minimum set of ISDN-DECT access procedures plus the following:

- the FT and PT shall support fss_clip (procedure 101).

5.3.18 Functional supplementary service CLIR (feature 102)

This feature shall be implemented by the minimum set of ISDN-DECT access procedures plus the following:

- the FT and PT shall support fss_clir (procedure 102).

5.3.19 Functional supplementary service COLP (feature 103)

This feature shall be implemented by the minimum set of ISDN-DECT access procedures plus the following:

- the FT and PT shall support fss_colp (procedure 103).

5.3.20 Functional supplementary service COLR (feature 104)

This feature shall be implemented by the minimum set of ISDN-DECT access procedures plus the following:

- the FT and PT shall support fss_colr (procedure 104).

5.3.21 Functional supplementary service MSN (feature 105)

This feature shall be implemented by the minimum set of ISDN-DECT access procedures plus the following:

- the FT and PT shall support fss_msn (procedure 105).

5.3.22 Functional supplementary service DDI (feature 106)

This feature shall be implemented by the minimum set of ISDN-DECT access procedures plus the following:

- the FT and PT shall support fss_ddi (procedure 106).

5.3.23 Functional supplementary service SUB (feature 107)

This feature shall be implemented by the minimum set of ISDN-DECT access procedures plus the following:

- the FT and PT shall support fss_sub (procedure 107).

5.3.24 Functional supplementary service CW (feature 108)

This feature shall be implemented by the minimum set of ISDN-DECT access procedures plus the following:

- the FT and PT shall support fss_cw (procedure 108).

5.3.25 Functional supplementary service HOLD (feature 109)

This feature shall be implemented by the minimum set of ISDN-DECT access procedures plus the following:

- the FT and PT shall support fss_ch (procedure 109).

5.3.26 Functional supplementary service CUG (feature 110)

This feature shall be implemented by the minimum set of ISDN-DECT access procedures plus the following:

- the FT and PT shall support fss_cug (procedure 110).

5.3.27 Functional supplementary service AOC (feature 111)

This feature shall be implemented by the minimum set of ISDN-DECT access procedures plus the following:

- the FT and PT shall support fss_aoc (procedure 111).

5.3.28 Functional supplementary service MCID (feature 112)

This feature shall be implemented by the minimum set of ISDN-DECT access procedures plus the following:

- the FT and PT shall support fss_mcid (procedure 112).

5.3.29 Functional supplementary service CONF (feature 113)

This feature shall be implemented by the minimum set of ISDN-DECT access procedures plus the following:

- the FT and PT shall support fss_conf (procedure 113).

5.3.30 Functional supplementary service 3PTY (feature 114)

This feature shall be implemented by the minimum set of ISDN-DECT access procedures plus the following:

- the FT and PT shall support fss_3pty (procedure 114).

5.3.31 Functional supplementary service CD (feature 115)

This feature shall be implemented by the minimum set of ISDN-DECT access procedures plus the following:

- the FT and PT shall support fss_cd (procedure 115).

5.3.32 Functional supplementary service UUS1 (feature 116)

This feature shall be implemented by the minimum set of ISDN-DECT access procedures plus the following:

- the FT and PT shall support fss_uus1 (procedure 116).

5.3.33 Functional supplementary service UUS2 (feature 117)

This feature shall be implemented by the minimum set of ISDN-DECT access procedures plus the following:

- the FT and PT shall support fss_uus2 (procedure 117).

5.3.34 Functional supplementary service UUS3 (feature 118)

This feature shall be implemented by the minimum set of ISDN-DECT access procedures plus the following:

- the FT and PT shall support fss_uus3 (procedure 118).

5.3.35 Functional supplementary service ECT (feature 119)

This feature shall be implemented by the minimum set of ISDN-DECT access procedures plus the following:

- the FT and PT shall support fss_ect (procedure 119).

5.3.36 Functional supplementary service CCBS (feature 120)

This feature shall be implemented by the minimum set of ISDN-DECT access procedures plus the following:

- the FT and PT shall support fss_ccbs (procedure 120).

5.3.37 Functional supplementary service FPH (feature 121)

This feature shall be implemented by the minimum set of ISDN-DECT access procedures plus the following:

- the FT and PT shall support fss_fph (procedure 121).

5.3.38 Functional supplementary service MMC (feature 122)

This feature shall be implemented by the minimum set of ISDN-DECT access procedures plus the following:

- the FT and PT shall support fss_mmc (procedure 122).

5.3.39 Functional supplementary service CF (feature 123)

This feature shall be implemented by the minimum set of ISDN-DECT access procedures plus the following:

- the FT and PT shall support fss_cf (procedure 123).

6 Requirements regarding the DLC layer

As specified in ETS 300 175-4 [4].

6.1 Control plane

6.1.1 Minimum requirements

The following types of operation shall be supported:

- class A acknowledged transfer operation over a connection oriented and connectionless MAC service.

Frames shall be fragmented to use the C_S logical channel.

For the segmentation of long messages the "more data bit" shall be used.

6.1.2 Incoming call (feature 16)

Short format and long format broadcast frames shall be supported.

6.2 User plane

The LU1 transparent unprotected service shall be supported if feature 1 or 60 is used.

The LU7 64 kbit/s data bearer service shall be supported if feature 75 is used.

The FU1 frame structure shall be supported.

The FU7 frame structure shall be supported if feature 75 is used.

7 MAC layer requirements

This clause refers to elements specified in ETS 300 175-3 [3]. ISDN-DECT access equipment shall provide at least all of the elements stated below plus the mandatory elements of the ETS 300 175-3 [3].

7.1 MAC layer services

7.1.1 Connection oriented services

If the duplex speech feature (feature 1) or voice band data (feature 60) is used, the FT and PT shall support basic connections, these are from service type 1f (I_N_minimum_delay). At least the B-field multiplex type U32a shall be supported.

If the 64 kbit/s unrestricted digital information feature (feature 75) is used, the FT and PT shall support advanced connections, these are from service type 2d (I_N_normal_delay). At least the B-field multiplex types U80a and E80 shall be supported.

7.1.2 Broadcast services

The FT shall support the continuous broadcast service.

7.2 MAC layer procedures

7.2.1 Connection oriented service procedures

7.2.1.1 General

The FT and PT shall support the basic connection set-up procedure and the A-field connection release procedure.

The FT and PT shall support the advanced connection set-up procedure if the feature 64 kbit/s data bearer service (feature 75) is used.

> NOTE: The basic set-up procedure creates a basic connection. The advanced set-up procedure creates an advanced connection.

7.3 Required messages

7.3.1 Header field

The FT and PT shall understand all tail identifications.

The FT and PT shall be able to send at least the following tail identifications codes:

a0	a1	a2	Tail contents	Restrictions
0	0	0	C_T data packet number 0	
0	0	1	C_T data packet number 1	
0	1	1	identities information (N_T)	
1	0	0	multiframe synchronisation and system information (Q_T)	RFP only
1	1	0	MAC layer control (M_T)	
1	1	1	first CPP transmission (M_T)	PP only

"RFP only": means RFP transmissions only;
"PP only": means PP transmissions only.

The FT shall react correctly to the B field identification for "U type, I_N" and shall be able to send the B field identifications for "U type, I_N" and "no B-field".

The PT shall react correctly to the B field identifications for "U type, I_N" and "no B-field" and shall be able to send the B field identification for "U type, I_N".

The FT and PT shall be able to send and shall react correctly to the Q1 and Q2 bits using the procedures defined in ETS 300 175-3 [3] subclauses and 10.8.2.3.

7.3.2 Messages in the tail field

7.3.2.1 Identities information (N_T tail)

PT and FT shall be able to send, and shall react correctly to the N_T tail.

7.3.2.2 System information and multiframe marker (Q$_T$ tail)

The FT shall be able to send and the PT shall understand at least the following Q$_T$ messages:

QH	System Information	Man	Freq
000X	static system info	Yes	8
0010	extended RF carriers	note	8
0011	FP capabilities	Yes	8
0101	SARI list contents	No	8

where:

Man: mandatory transmission (Yes/No);
Freq: maximum repeat interval in multiframes, if implemented.

> NOTE: Transmission of the "extended RF carriers" message is only mandated for FPs that support extended RF carrier operation.

7.3.2.3 Paging (P$_T$ tail)

The PT shall understand the following tail identification code and for the incoming call (feature 16) the FT shall be able to send the following additional tail identification code:

a0	a1	a2	Tail contents	Restrictions
1	1	1	paging tail (P$_T$)	RFP only

"RFP only": means RFP transmissions only.

The PT shall be able to understand at least one of the following PT type tail messages and the FT shall be able to send at least one of the following PT type tail messages:

- short page message;
- full page message.

For incoming calls the FT shall page the PT in normal paging mode by using only full page messages or short page messages or both. Normal paging mode is defined in the RFP paging procedure of ETS 300 175-3 [3].

For the feature 64 kbit/s unrestricted digital information (feature 75) full page messages shall be used.

The low duty cycle idle_locked mode paging service is permitted.

The PT shall react correctly to both full page and short page messages. Detection and processing of paging messages is defined in the paging procedure of ETS 300 175-3 [3].

7.3.2.4 MAC control (M$_T$ tails)

PT and FT shall be able to send and shall react correctly to the following groups of messages:

- the basic connection control messages. The "unconfirmed_access_request" message shall not be used for a basic connection;

- the following advanced connection control messages if the feature 64 kbit/s data bearer service (feature 75) is used:

  - access_request, bearer_handover_request, connection_handover_request, bearer_confirm, wait, attributes_B_request, attributes_B_confirm, release;

- MAC test messages. Equipment shall only respond to MAC test messages when operating in the "Test-Standby-Mode", see I-ETS 300 176 [11].

7.3.3   Messages in the B-field

No operations that require transmission or response to B-field messages is required for the minimum ISDN-DECT access profile.

If feature 75 if used, then for the MAC signalling B-field messages shall be used.

Equipment shall understand the tail code associated with B-field messages as defined in ETS 300 175-3 [3] subclause 7.1.4. Received B-field messages should be discarded if they cannot be understood.

7.4   Monitoring of speech quality

If the duplex speech is used (feature 1) then the X-CRC information from received slot with I_N data should be used to support monitoring of received speech quality.

8   Requirements regarding the PHL layer

8.1   General

As specified in ETS 300 175-2 [2].

To carry the speech information (feature 1) or voice band data (feature 60), full slots shall be used.

To carry the 64 kbit/s unrestricted digital information (feature 75), double slots shall be used.

9   Requirements regarding the speech transmission

9.1   General

If duplex speech is used (feature 1) then the applicable requirements specified in ETS 300 175-8 [8] shall be applied.

Annex A (informative): Bibliography

-    ETR 015: "Radio Equipment and Systems (RES); Digital European Cordless Telecommunications (DECT); Reference document".

-    ETR 043: "Radio Equipment and Systems (RES); Digital European Cordless Telecommunications (DECT); Common interface; Services and facilities requirements specification".

-    ETR 056: "Radio Equipment and Systems (RES); Digital European Cordless Telecommunications (DECT); System description document".

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