



**SLOVENSKI STANDARD**  
**SIST EN 300 175-8 V2.7.1:2018**  
**01-februar-2018**

---

**Digitalne izboljšane brezvrvične telekomunikacije (DECT) - Skupni vmesnik (CI) - 8.  
del: Kodiranje in prenos govora in zvoka**

Digital Enhanced Cordless Telecommunications (DECT) - Common Interface (CI) - Part  
8: Speech and audio coding and transmission

**iTeh STANDARD PREVIEW**  
**(standards.iteh.ai)**

Ta slovenski standard je istoveten z: **ETSI EN 300 175-8 V2.7.1 (2017-11)**  
SIST EN 300 175-8 V2.7.1:2018  
<https://standards.iteh.ai/catalog/standards/sist/c42a01a1-ca5a-4a74-862b-7d11ce4d374b/sist-en-300-175-8-v2-7-1-2018>

---

**ICS:**

33.070.30	Digitalne izboljšane brezvrvične telekomunikacije (DECT)	Digital Enhanced Cordless Telecommunications (DECT)
-----------	----------------------------------------------------------------	--------------------------------------------------------

**SIST EN 300 175-8 V2.7.1:2018**                      **en**

**iTeh STANDARD PREVIEW**  
**(standards.iteh.ai)**

SIST EN 300 175-8 V2.7.1:2018

<https://standards.iteh.ai/catalog/standards/sist/c42a6fa1-ca5a-4a74-862b-7d11ce4d374b/sist-en-300-175-8-v2-7-1-2018>

# ETSI EN 300 175-8 V2.7.1 (2017-11)



## Digital Enhanced Cordless Telecommunications (DECT); Common Interface (CI); Part 8: Speech and audio coding and transmission

[SIST EN 300 175-8 V2.7.1:2018](https://standards.iteh.ai/catalog/standards/sist/c42a6fa1-ca5a-4a74-862b-7d11ce4d374b/sist-en-300-175-8-v2-7-1-2018)

<https://standards.iteh.ai/catalog/standards/sist/c42a6fa1-ca5a-4a74-862b-7d11ce4d374b/sist-en-300-175-8-v2-7-1-2018>

---

**Reference**REN/DECT-00307-8

---

---

**Keywords**

7 kHz, audio, broadband, codec, DECT, handsfree, IMT-2000, loudspeaking, mobility, narrowband, quality, radio, speech, TDD, TDMA, telephony, terminal

**ETSI**

650 Route des Lucioles  
F-06921 Sophia Antipolis Cedex - FRANCE

---

Tel.: +33 4 92 94 42 00 Fax: +33 4 93 65 47 16

Siret N° 348 623 562 00017 - NAF 742 C  
Association à but non lucratif enregistrée à la  
Sous-Préfecture de Grasse (06) N° 7803/88

**iTeh STANDARD PREVIEW**  
**(standards.iteh.ai)**

---

**Important notice**

<https://standards.iteh.ai/catalog/standards/sist/c42a6fa1-ca5a-4a74-862b-7d11c5434905/sist-en-300-175-8-v2-7-1-2018>  
The present document can be downloaded from:  
<http://www.etsi.org/standards-search>

The present document may be made available in electronic versions and/or in print. The content of any electronic and/or print versions of the present document shall not be modified without the prior written authorization of ETSI. In case of any existing or perceived difference in contents between such versions and/or in print, the only prevailing document is the print of the Portable Document Format (PDF) version kept on a specific network drive within ETSI Secretariat.

Users of the present document should be aware that the document may be subject to revision or change of status. Information on the current status of this and other ETSI documents is available at <https://portal.etsi.org/TB/ETSIDeliverableStatus.aspx>

If you find errors in the present document, please send your comment to one of the following services:  
<https://portal.etsi.org/People/CommiteeSupportStaff.aspx>

---

**Copyright Notification**

---

No part may be reproduced or utilized in any form or by any means, electronic or mechanical, including photocopying and microfilm except as authorized by written permission of ETSI.

The content of the PDF version shall not be modified without the written authorization of ETSI.

The copyright and the foregoing restriction extend to reproduction in all media.

© ETSI 2017.  
All rights reserved.

**DECT™**, **PLUGTESTS™**, **UMTS™** and the ETSI logo are trademarks of ETSI registered for the benefit of its Members. **3GPP™** and **LTE™** are trademarks of ETSI registered for the benefit of its Members and of the 3GPP Organizational Partners.

**oneM2M** logo is protected for the benefit of its Members.

**GSM®** and the GSM logo are trademarks registered and owned by the GSM Association.

# Contents

Intellectual Property Rights .....	12
Foreword.....	12
Modal verbs terminology.....	12
1 Scope .....	13
2 References .....	13
2.1 Normative references .....	13
2.2 Informative references.....	15
3 Definitions, symbols and abbreviations .....	16
3.1 Definitions.....	16
3.2 Symbols and abbreviations.....	17
4 Configurations .....	19
4.1 Reference configuration .....	19
4.1.1 Basic configuration .....	19
4.1.2 Portable Part (PP) .....	21
4.1.2.1 Functional organization.....	21
4.1.2.2 Volume control .....	21
4.1.3 Fixed Part (FP).....	21
4.1.3.1 Digital interface.....	21
4.1.3.2 Analog interface .....	23
4.1.3.3 FP adaptive volume control.....	23
4.2 Test configurations.....	23
5 Encoding.....	23
5.0 General .....	23
5.1 32 kbit/s full term (ADPCM) G.726.....	24
5.1.1 Algorithm.....	24
5.1.2 Bit sequence.....	24
5.1.3 Characteristics of G.726 ADPCM codec .....	24
5.2 64 kbit/s PCM G.711.....	24
5.2.1 Algorithm.....	24
5.2.2 Bit sequence.....	24
5.2.3 Characteristics of G.711 PCM codec.....	25
5.2.4 Automatic detection of FAX/modem tone and switch to G.711 .....	25
5.3 Wideband speech codec G.722 at 64 kbit/s.....	25
5.3.0 General.....	25
5.3.1 Algorithm.....	25
5.3.2 Bit sequence.....	25
5.3.3 Characteristics of G.722 wideband codec.....	25
5.3.4 Optional Packet Loss Concealment algorithm (PLC).....	26
5.4 Wideband speech codec G.729.1 up to 32 kbit/s.....	26
5.4.1 Algorithm.....	26
5.4.2 Bit sequence.....	26
5.4.3 Characteristics of G.729.1 codec .....	26
5.4.4 Packet Loss Concealment algorithm (PLC).....	27
5.4.5 Supported bit rate in DECT .....	27
5.5 Super-wideband MPEG-4 speech and audio coding .....	27
5.5.1 Algorithm.....	27
5.5.2 64 kbit/s, MPEG-4 ER AAC-LD codec.....	28
5.5.3 32 kbit/s, MPEG-4 ER AAC-LD codec.....	28
5.6 Other codings .....	28
6 Transmission aspects.....	29
6.1 Relative level.....	29
6.2 Acoustic reference level .....	29
6.3 Volume control.....	29

STANDARD PREVIEW  
(standards.iteh.ai)

7	Audio specifications .....	29
7.1	Overall description .....	29
7.1.1	Introduction to DECT audio specifications .....	29
7.1.2	Introduction to the audio types .....	29
7.1.3	List of Audio types .....	30
7.1.4	Audio types for Portable Parts .....	31
7.1.5	Audio types for Fixed Parts .....	32
7.1.6	Complete DECT system .....	32
7.1.7	Structure of the specification of the audio types .....	32
7.1.8	Audio Types and codecs .....	38
7.1.9	Audio Types and physical interfaces .....	38
7.2	Audio types applicable to Portable Parts .....	38
7.2.0	General .....	38
7.2.1	Performance levels of DECT Portable Parts (handsets) .....	38
7.2.2	Type 0: Reference PP (RePP) .....	39
7.2.3	PP Type 1a: "Classic" GAP narrowband handset .....	40
7.2.3.1	Introduction .....	40
7.2.3.2	Compatible services and codecs .....	40
7.2.3.3	Specification .....	40
7.2.4	PP Type 1b: "Improved" GAP narrowband handset .....	40
7.2.4.1	Introduction .....	40
7.2.4.2	Compatible services and codecs .....	40
7.2.4.3	Specification .....	40
7.2.5	PP Type 1c: HATS-tested "standard" narrowband handset .....	41
7.2.5.1	Introduction .....	41
7.2.5.2	Compatible services and codecs .....	41
7.2.5.3	Specification .....	41
7.2.6	PP Type 1d: HATS-tested "improved" narrowband handset .....	41
7.2.6.1	Introduction .....	41
7.2.6.2	Compatible services and codecs .....	41
7.2.6.3	Specification .....	41
7.2.7	PP Type 3a: HATS tested narrowband "standard" loudspeaking handsfree .....	42
7.2.7.1	Introduction .....	42
7.2.7.2	Compatible services and codecs .....	42
7.2.7.3	Specification .....	42
7.2.8	PP Type 3b: HATS tested narrowband "improved" loudspeaking handsfree .....	42
7.2.8.1	Introduction .....	42
7.2.8.2	Compatible services and codecs .....	42
7.2.8.3	Specification .....	42
7.2.9	PP Type 2a: P.311-tested wideband handset .....	43
7.2.9.1	Introduction .....	43
7.2.9.2	Compatible services and codecs .....	43
7.2.9.3	Specification .....	43
7.2.10	PP Type 2b: HATS-tested "standard" wideband handset or headset .....	43
7.2.10.1	Introduction .....	43
7.2.10.2	Compatible services and codecs .....	43
7.2.10.3	Specification .....	43
7.2.11	PP Type 2c: HATS tested "improved" wideband handset or headset .....	44
7.2.11.1	Introduction .....	44
7.2.11.2	Compatible services and codecs .....	44
7.2.11.3	Specification .....	44
7.2.12	PP Type 4a: HATS tested wideband "standard" loudspeaking handsfree .....	44
7.2.12.1	Introduction .....	44
7.2.12.2	Compatible services and codecs .....	44
7.2.12.3	Specification .....	44
7.2.13	PP Type 4b: HATS tested wideband "improved" loudspeaking and handsfree .....	45
7.2.13.1	Introduction .....	45
7.2.13.2	Compatible services and codecs .....	45
7.2.13.3	Specification .....	45
7.2.14	PP Type 5a: super-wideband 14 kHz handset .....	45
7.2.14.1	Introduction .....	45
7.2.14.2	Compatible services and codecs .....	45

7.2.14.3	Specification.....	45
7.2.15	PP Type 5b: super-wideband 14 kHz loudspeaking handsfree .....	45
7.2.15.1	Introduction.....	45
7.2.15.2	Compatible services and codecs.....	45
7.2.15.3	Specification.....	45
7.2.16	PP Type 6: PPs with external 2 wire, 3,1 kHz telephony interface.....	46
7.2.16.1	Introduction.....	46
7.2.16.2	Compatible services and codecs.....	46
7.2.16.3	Specification.....	46
7.3	Audio transmission types applicable to Fixed Parts .....	46
7.3.0	General.....	46
7.3.1	FP Type 0: Reference FP (ReFP).....	46
7.3.2	FP Type 1a: "classical" Fixed Part for ISDN Network .....	47
7.3.2.1	Introduction.....	47
7.3.2.2	Compatible services and codecs.....	47
7.3.2.3	Specifications .....	47
7.3.2.3.1	Transcoding and equalization .....	47
7.3.2.3.2	PP type detection .....	48
7.3.2.3.3	Activation of audio processing functions .....	48
7.3.2.3.4	Transmission specification .....	48
7.3.3	FP Type 1b: "new" Fixed Part for ISDN Network .....	48
7.3.3.1	Introduction.....	48
7.3.3.2	Compatible services and codecs.....	49
7.3.3.3	Specification.....	49
7.3.3.3.1	Transcoding and equalization .....	49
7.3.3.3.2	PP type detection .....	49
7.3.3.3.3	Activation of audio processing functions .....	49
7.3.3.3.4	Transmission specification .....	50
7.3.4	FP Type 2: FP with analog 2-wire interface, 3.1 kHz service .....	50
7.3.4.1	Introduction.....	50
7.3.4.2	Compatible services, physical interfaces and codecs .....	50
7.3.4.3	Specification.....	50
7.3.4.3.1	Transcoding, equalization and conversion .....	50
7.3.4.3.2	PP type detection and activation of audio processing functions .....	51
7.3.4.3.3	Transmission specification .....	51
7.3.5	FP Type 3: VoIP narrowband Fixed Part.....	51
7.3.5.1	Introduction.....	51
7.3.5.2	Compatible services, physical interfaces and codecs .....	51
7.3.5.3	Specification.....	52
7.3.5.3.1	Transcoding and equalization .....	52
7.3.5.3.2	PP type detection .....	52
7.3.5.3.3	Activation of audio processing functions .....	52
7.3.5.3.4	Transmission specification .....	53
7.3.6	FP Type 4: ISDN wideband Fixed Part .....	53
7.3.6.1	Introduction.....	53
7.3.6.2	Compatible services and codecs.....	53
7.3.6.3	Specification.....	54
7.3.6.3.1	Transcoding and equalization .....	54
7.3.6.3.2	PP type detection .....	54
7.3.6.3.3	Activation of audio processing functions .....	54
7.3.6.3.4	Transmission specification .....	54
7.3.7	FP Type 5: VoIP wideband Fixed Part .....	55
7.3.7.1	Introduction.....	55
7.3.7.2	Compatible services, physical interfaces and codecs .....	55
7.3.7.3	Specification.....	55
7.3.7.3.1	Transcoding and equalization .....	55
7.3.7.3.2	PP type detection .....	55
7.3.7.3.3	Activation of audio processing functions .....	56
7.3.7.3.4	Transmission specification .....	56
7.3.8	FP Type 6a: FP handling an Internal call inside a DECT FP (any service) .....	56
7.3.8.1	Introduction.....	56
7.3.8.2	Compatible services, physical interfaces and codecs .....	56

7.3.8.3	Specification.....	57
7.3.9	FP Type 6b: FP handling an n-party conference inside a DECT FP (any service).....	57
7.3.9.1	Introduction.....	57
7.3.9.2	Compatible services, physical interfaces and codecs.....	57
7.3.9.3	Specification for the conference bridge.....	57
7.3.10	FP Type 7: DECT Repeater part (REP).....	57
7.3.10.1	Introduction.....	57
7.3.10.2	Compatible services, physical interfaces and codecs.....	57
7.3.10.3	Specification.....	57
7.4	Additional features.....	58
7.4.1	Introduction.....	58
7.4.2	Echo canceller in Fixed Part.....	58
7.4.3	Echo suppressor in Fixed Part.....	59
7.5	Transmission characteristics for Portable Parts.....	59
7.5.1	Transmission characteristics for Portable Part type 1a ("Classic GAP" handset).....	59
7.5.1.1	PP frequency responses.....	59
7.5.1.1.1	Sending.....	59
7.5.1.1.2	Receiving.....	60
7.5.1.2	PP sending and receiving loudness ratings.....	60
7.5.1.2.1	Nominal values.....	60
7.5.1.2.2	User-controlled volume control in PP.....	60
7.5.1.2.3	PP adaptive volume control.....	61
7.5.1.3	Sidetone.....	61
7.5.1.3.1	Talker sidetone.....	61
7.5.1.3.2	Listener sidetone.....	61
7.5.1.4	Terminal coupling loss.....	62
7.5.1.4.1	Weighted Terminal Coupling Loss (TCLw).....	62
7.5.1.4.2	Stability loss.....	62
7.5.1.5	Distortion.....	62
7.5.1.5.1	Sending.....	62
7.5.1.5.2	Receiving.....	63
7.5.1.5.3	Sidetone.....	63
7.5.1.6	Out of band signals.....	63
7.5.1.6.1	Sending (discrimination against out of band input signals).....	63
7.5.1.6.2	Receiving (spurious out of band signals).....	63
7.5.1.7	Noise.....	63
7.5.1.7.1	Sending.....	63
7.5.1.7.2	Band-limited noise.....	63
7.5.1.7.3	Receiving.....	63
7.5.1.7.4	Level of sampling frequency (receiving).....	64
7.5.1.8	Acoustic shock.....	64
7.5.1.8.0	General.....	64
7.5.1.8.1	Continuous signal.....	64
7.5.1.8.2	Peak signal.....	64
7.5.1.9	PP Delay.....	64
7.5.1.10	PP ambient noise rejection.....	64
7.5.2	Additional requirements for PP type 1b ("improved GAP" handset).....	64
7.5.2.0	General.....	64
7.5.2.1	Terminal coupling loss.....	64
7.5.2.1.1	Weighted Terminal Coupling Loss (TCLw).....	64
7.5.2.2	Attenuation Range in Sending Direction during Double Talk $A_{H,S,dt}$ .....	65
7.5.2.3	Attenuation Range in Receiving Direction during Double Talk $A_{H,R,dt}$ .....	65
7.5.2.4	Activation in Sending Direction.....	65
7.5.2.5	Activation in Receiving Direction.....	66
7.5.3	Transmission characteristics for PP types 1c and 1d (HATS tested, narrowband telephony handsets).....	66
7.5.3.1	PP frequency responses.....	66
7.5.3.1.1	Sending.....	66
7.5.3.1.2	Receiving.....	67
7.5.3.2	PP sending and receiving loudness ratings.....	69
7.5.3.2.1	Nominal values.....	69
7.5.3.2.2	User-controlled volume control in PP.....	70
7.5.3.2.3	PP adaptive volume control.....	70



7.5.3.3	Sidetone.....	71
7.5.3.3.1	Talker sidetone .....	71
7.5.3.3.2	D Factor.....	71
7.5.3.3.3	Sidetone delay .....	71
7.5.3.4	Terminal coupling loss.....	71
7.5.3.4.1	TCLw of Portable Part.....	71
7.5.3.4.2	Stability loss .....	72
7.5.3.5	Distortion .....	72
7.5.3.5.1	Sending Distortion.....	72
7.5.3.5.2	Receiving Distortion.....	72
7.5.3.6	Out of band signals.....	72
7.5.3.6.1	Out-of-band Signals in Send direction .....	72
7.5.3.6.2	Out-of-band signals in receiving direction .....	73
7.5.3.7	Noise .....	73
7.5.3.7.1	Sending.....	73
7.5.3.7.2	Receiving.....	73
7.5.3.8	Acoustic shock.....	74
7.5.3.8.0	General .....	74
7.5.3.8.1	Continuous signal .....	74
7.5.3.8.2	Peak signal.....	74
7.5.3.9	Delay.....	74
7.5.3.10	Variation of gain with input level-sending.....	74
7.5.3.11	Double Talk Performance .....	75
7.5.3.11.0	General .....	75
7.5.3.11.1	Attenuation Range in Sending Direction during Double Talk $A_{H,S,dt}$ .....	75
7.5.3.11.2	Attenuation Range in Receiving Direction during Double Talk $A_{H,S,dt}$ .....	75
7.5.3.11.3	Detection of Echo Components during Double Talk .....	76
7.5.3.11.4	Minimum activation level and sensitivity of double talk detection .....	76
7.5.3.12	Switching characteristics.....	76
7.5.3.12.0	General .....	76
7.5.3.12.1	Activation in Sending Direction .....	76
7.5.3.12.2	Activation in Receiving Direction.....	77
7.5.3.12.3	Silence Suppression and Comfort Noise Generation.....	77
7.5.3.12.4	Performance in sending direction in the presence of background noise.....	77
7.5.3.12.5	Speech Quality in the Presence of Background Noise.....	77
7.5.3.12.6	Quality of Background Noise Transmission (with Far End Speech).....	78
7.5.3.12.7	Quality of background noise transmission (with Near End Speech) .....	78
7.5.3.13	Quality of echo cancellation.....	78
7.5.3.13.0	General .....	78
7.5.3.13.1	Temporal echo effects .....	78
7.5.3.13.2	Spectral Echo Attenuation .....	78
7.5.4	Transmission characteristics for PP types 3a and 3b (narrowband loudspeaking and handsfree devices).....	79
7.5.4.1	Sending sensitivity/frequency response .....	79
7.5.4.2	Receive sensitivity/frequency response.....	79
7.5.4.3	Sending loudness rating .....	82
7.5.4.4	Receive loudness rating.....	82
7.5.4.5	Sending distortion .....	83
7.5.4.6	Receiving distortion .....	83
7.5.4.7	Out-of-band signals in sending direction .....	83
7.5.4.8	Out-of-band signals in receiving direction .....	84
7.5.4.9	Sending noise .....	84
7.5.4.10	Receiving noise .....	84
7.5.4.11	Terminal Coupling Loss of PP.....	85
7.5.4.12	Stability Loss of PP.....	85
7.5.4.13	Double Talk Performance .....	85
7.5.4.13.0	General .....	85
7.5.4.13.1	Attenuation Range in Sending Direction during Double Talk $A_{H,S,dt}$ .....	85
7.5.4.13.2	Attenuation Range in Receiving Direction during Double Talk $A_{H,R,dt}$ .....	86
7.5.4.13.3	Detection of Echo Components during Double Talk.....	86
7.5.4.13.4	Minimum activation level and sensitivity of double talk detection.....	87
7.5.4.14	Switching characteristics.....	87

7.5.4.14.0	General .....	87
7.5.4.14.1	Activation in Sending Direction .....	87
7.5.4.14.2	Activation in Receiving Direction .....	87
7.5.4.14.3	Silence Suppression and Comfort Noise Generation .....	88
7.5.4.14.4	Performance in sending direction in the presence of background noise .....	88
7.5.4.14.5	Speech Quality in the Presence of Background Noise .....	88
7.5.4.14.6	Quality of Background Noise Transmission (with Far End Speech) .....	88
7.5.4.14.7	Quality of background noise transmission (with Near End Speech) .....	88
7.5.4.15	Quality of echo cancellation .....	89
7.5.4.15.0	General .....	89
7.5.4.15.1	Temporal echo effects .....	89
7.5.4.15.2	Spectral Echo Attenuation .....	89
7.5.5	Transmission characteristics for PP type 2a (P.311 tested, wideband handset) .....	89
7.5.5.0	General .....	89
7.5.5.1	Sending characteristics .....	89
7.5.5.1.1	Loudness rating .....	89
7.5.5.1.2	Sensitivity/frequency characteristics .....	90
7.5.5.1.3	Noise .....	90
7.5.5.1.4	Distortion .....	90
7.5.5.1.5	Discrimination against out-of-band input signals .....	90
7.5.5.2	Receiving characteristics .....	90
7.5.5.2.1	Loudness rating .....	90
7.5.5.2.2	Sensitivity/frequency characteristics .....	90
7.5.5.2.3	Noise .....	90
7.5.5.2.4	Distortion .....	91
7.5.5.2.5	Spurious out-of-band receiving signals .....	91
7.5.5.3	Sidetone characteristics .....	91
7.5.5.3.1	Talker sidetone .....	91
7.5.5.3.2	Sidetone distortion .....	91
7.5.5.4	Echo path loss characteristics .....	91
7.5.5.4.1	Weighted terminal coupling loss .....	91
7.5.5.4.2	Stability loss .....	92
7.5.6	Transmission characteristics for PP type 2b and 2c (HATS tested wideband handsets) .....	92
7.5.6.1	PP frequency responses .....	92
7.5.6.1.1	Sending .....	92
7.5.6.1.2	Receiving .....	93
7.5.6.2	PP send and receive loudness ratings .....	95
7.5.6.2.1	Nominal values .....	95
7.5.6.2.2	User-controlled volume control in PP .....	96
7.5.6.2.3	PP adaptive volume control .....	96
7.5.6.3	Sidetone .....	96
7.5.6.3.1	Talker sidetone .....	96
7.5.6.3.2	D Factor .....	97
7.5.6.3.3	Sidetone delay .....	97
7.5.6.4	Terminal coupling loss .....	97
7.5.6.4.1	Weighted Terminal Coupling Loss (TCL <sub>w</sub> ) .....	97
7.5.6.4.2	Stability loss .....	97
7.5.6.5	Distortion .....	98
7.5.6.5.1	Sending Distortion .....	98
7.5.6.5.2	Receiving Distortion .....	98
7.5.6.6	Noise .....	98
7.5.6.6.1	Sending .....	98
7.5.6.6.2	Receiving .....	99
7.5.6.7	Acoustic shock .....	99
7.5.6.7.0	General .....	99
7.5.6.7.1	Continuous signal .....	99
7.5.6.7.2	Peak signal .....	99
7.5.6.8	Delay .....	99
7.5.6.9	Variation of gain with input level-sending .....	99
7.5.6.10	Double talk Performance .....	100
7.5.6.10.0	General .....	100
7.5.6.10.1	Attenuation Range in Sending Direction during Double Talk A <sub>H,S,dt</sub> .....	100

7.5.6.10.2	Attenuation Range in Receiving Direction during Double Talk $A_{H,R,dt}$ .....	101
7.5.6.10.3	Detection of Echo Components during Double Talk.....	101
7.5.6.10.4	Minimum activation level and sensitivity of double talk detection.....	101
7.5.6.11	Switching characteristics.....	102
7.5.6.11.0	General.....	102
7.5.6.11.1	Activation in Sending Direction.....	102
7.5.6.11.2	Activation in Receiving Direction.....	102
7.5.6.11.3	Silence Suppression and Comfort Noise Generation.....	102
7.5.6.11.4	Performance in Sending in the Presence of Background Noise.....	102
7.5.6.11.5	Speech Quality in the Presence of Background Noise.....	103
7.5.6.11.6	Quality of Background Noise Transmission (with Far End Speech).....	103
7.5.6.11.7	Quality of background noise transmission (with Near End Speech).....	103
7.5.6.12	Quality of echo cancellation.....	103
7.5.6.12.0	General.....	103
7.5.6.12.1	Temporal echo effects.....	103
7.5.6.12.2	Spectral Echo Attenuation.....	104
7.5.7	Transmission characteristics for PP types 4a and 4b (HATS Tested wideband loudspeaking and handsfree devices).....	104
7.5.7.1	Sending sensitivity/frequency response.....	104
7.5.7.2	Receive sensitivity/frequency response.....	105
7.5.7.3	Sending loudness rating.....	108
7.5.7.4	Receive loudness rating.....	108
7.5.7.5	Sending distortion.....	109
7.5.7.6	Receiving distortion.....	109
7.5.7.7	Out-of-band signals in sending direction.....	110
7.5.7.8	Out-of-band signals in receiving direction.....	110
7.5.7.9	Sending noise.....	110
7.5.7.10	Receiving noise.....	110
7.5.7.11	Terminal Coupling Loss.....	111
7.5.7.12	Stability Loss.....	111
7.5.7.13	Double Talk Performance.....	111
7.5.7.13.0	General.....	111
7.5.7.13.1	Attenuation Range in Sending Direction during Double Talk $A_{H,S,dt}$ .....	112
7.5.7.13.2	Attenuation Range in Receiving Direction during Double Talk $A_{H,R,dt}$ .....	112
7.5.7.13.3	Detection of Echo Components during Double Talk.....	112
7.5.7.13.4	Minimum activation level and sensitivity of double talk detection.....	113
7.5.7.14	Switching characteristics.....	113
7.5.7.14.0	General.....	113
7.5.7.14.1	Activation in Sending Direction.....	113
7.5.7.14.2	Activation in Receiving Direction.....	113
7.5.7.14.3	Silence Suppression and Comfort Noise Generation.....	114
7.5.7.14.4	Performance in sending direction in the presence of background noise.....	114
7.5.7.14.5	Speech Quality in the Presence of Background Noise.....	114
7.5.7.14.6	Quality of Background Noise Transmission (with Far End Speech).....	114
7.5.7.14.7	Quality of background noise transmission (with Near End Speech).....	114
7.5.7.15	Quality of echo cancellation.....	115
7.5.7.15.1	Temporal echo effects.....	115
7.5.7.15.2	Spectral Echo Attenuation.....	115
7.6	Transmission characteristics for Fixed Parts.....	115
7.6.1	Transmission characteristics for FP type 1a ("Classic" Fixed Part with ISDN Network interface, 3,1 kHz service).....	115
7.6.1.1	Reduction of echo from PP.....	115
7.6.1.2	FP Network echo control.....	116
7.6.1.3	FP adaptive volume control.....	117
7.6.1.4	FP Delay.....	117
7.6.2	Transmission characteristics for FP type 1b ("new" Fixed Part with ISDN Network interface, 3,1 kHz service).....	117
7.6.2.0	General.....	117
7.6.2.1	FP Network echo control.....	117
7.6.2.2	FP adaptive volume control.....	117
7.6.2.3	FP Delay.....	118
7.6.3	Transmission characteristics for FP type 2 (Fixed Part with analog 2-wire interface, 3,1 kHz service).....	118

7.6.3.1	FP adaptive volume control .....	118
7.6.3.2	Network echo control .....	118
7.6.3.3	Additional requirements for DECT FP provided with a 2-wire PSTN interface .....	119
7.6.3.3.0	Test methods .....	119
7.6.3.3.1	General requirements .....	119
7.6.3.3.2	Speech performance characteristics .....	119
7.6.3.4	FP Delay .....	120
7.6.4	Transmission characteristics for FP type 3 (Fixed Part with VoIP interface, 3,1 kHz service) .....	120
7.6.4.1	Send delay .....	120
7.6.4.2	Receive delay .....	120
7.6.4.3	Adaptive volume control .....	121
7.6.5	Transmission characteristics for FP type 4 (Fixed Part with ISDN network interface, wideband service) .....	121
7.6.5.1	FP adaptive volume control .....	121
7.6.5.2	FP Delay .....	121
7.6.6	Transmission characteristics for FP type 5 (Fixed Part with VoIP interface, wideband service) .....	121
7.6.6.1	Send Delay .....	121
7.6.6.2	Receive delay .....	122
7.6.6.3	FP adaptive volume control .....	122
8	Additional features .....	122
8.1	Loudspeaking hands-free and headset facilities .....	122
8.1.1	Loudspeaking hands-free facility .....	122
8.1.2	Headset facility .....	122
8.2	Tandem with mobile radio network .....	122
8.2.0	General .....	122
8.2.1	Tandem with GSM .....	123
8.2.1.0	Configuration .....	123
8.2.1.1	Network echo control .....	123
8.2.1.2	Terminal coupling loss .....	123
8.2.1.3	The GSM mobile transmitter operates in continuous mode .....	123
8.2.1.4	The GSM mobile transmitter operates in discontinuous mode, DTX .....	123
8.3	DECT connected to the GSM fixed network .....	123
8.3.0	General .....	123
8.3.1	Network echo control .....	124
8.3.2	Terminal coupling loss .....	124
8.4	Wireless Relay Stations (WRS) .....	124
8.4.0	General .....	124
8.4.1	Modified FP network echo control requirements for implementation of 2 and 3 CRFP links in cascade .....	125
<b>Annex A (informative): Description of "reference" echo control devices .....</b>		<b>126</b>
A.0	General .....	126
A.1	Handset echo .....	126
A.1.0	Applicability .....	126
A.1.1	Overview .....	126
A.1.1.1	Connection to the PSTN/ISDN .....	126
A.1.1.1.0	General .....	126
A.1.1.1.1	Local and national calls .....	126
A.1.1.1.2	Long distance connections with echo control devices in the PSTN/ISDN, e.g. calls via satellites .....	126
A.1.1.2	Connection to the GSM network .....	127
A.1.2	Implementation of the FP echo control function .....	127
A.1.2.0	General .....	127
A.1.2.1	Suppression threshold .....	128
A.1.2.2	Static characteristics of activation control .....	128
A.1.2.3	Dynamic characteristics of activation control .....	128
A.2	Network echo .....	128
A.2.0	Applicability .....	128
A.2.1	Soft suppressor implementation of requirement 2 .....	129
A.2.1.0	General .....	129

A.2.1.1	Static characteristics .....	130
A.2.1.2	Dynamic characteristics .....	130
A.2.2	Additional echo control for a 2-wire interface of requirement 1 .....	130
A.2.3	Echo canceller used for both requirements 1 and 2 .....	131
<b>Annex B (informative): Local loop application .....</b>		<b>132</b>
B.0	General .....	132
B.1	DECT tethered local loop replacement with 2-wire PP end system.....	132
B.1.0	Configuration .....	132
B.1.1	TCLw requirements.....	132
B.1.2	Network echo .....	133
<b>Annex C (informative): GSM Discontinuous Transmission (DTX), and Voice Activity Detection (VAD).....</b>		<b>134</b>
<b>Annex D (informative): Speech levels in relation to ambient room noise and examples of adaptive volume control settings .....</b>		<b>135</b>
<b>Annex E (informative): Echo related topics.....</b>		<b>136</b>
E.1	Summary table on echo parameters for PPs and FPs .....	136
E.2	General information about Delay-Echo interaction for DECT terminals.....	142
<b>Annex F (informative): Guidelines on specific requirements.....</b>		<b>145</b>
F.1	Delay requirements for FPs with VoIP interface .....	145
F.1.1	Delay requirements for FP type 3 (Fixed Part with VoIP interface, 3,1 kHz service).....	145
F.1.1.0	General.....	145
F.1.1.1	Send delay.....	145
F.1.1.2	Receive delay.....	146
F.1.2	Delay requirements for FP type 5 (Fixed Part with VoIP interface, wideband service).....	147
F.1.2.0	General.....	147
F.1.2.1	Send Delay.....	147
F.1.2.2	Receive delay.....	148
<b>Annex G (informative): Bibliography.....</b>		<b>150</b>
<b>Annex H (informative): Change history .....</b>		<b>151</b>
History .....		152

---

## Intellectual Property Rights

### Essential patents

IPRs essential or potentially essential to the present document may have been declared to ETSI. The information pertaining to these essential IPRs, if any, is publicly available for **ETSI members and non-members**, and can be found in ETSI SR 000 314: "*Intellectual Property Rights (IPRs); Essential, or potentially Essential, IPRs notified to ETSI in respect of ETSI standards*", which is available from the ETSI Secretariat. Latest updates are available on the ETSI Web server (<https://ipr.etsi.org/>).

Pursuant to the ETSI IPR Policy, no investigation, including IPR searches, has been carried out by ETSI. No guarantee can be given as to the existence of other IPRs not referenced in ETSI SR 000 314 (or the updates on the ETSI Web server) which are, or may be, or may become, essential to the present document.

### Trademarks

The present document may include trademarks and/or tradenames which are asserted and/or registered by their owners. ETSI claims no ownership of these except for any which are indicated as being the property of ETSI, and conveys no right to use or reproduce any trademark and/or tradename. Mention of those trademarks in the present document does not constitute an endorsement by ETSI of products, services or organizations associated with those trademarks.

---

## Foreword

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

The present document is part 8 of a multi-part deliverable ([1] to [7]). Full details of the entire series can be found in part 1 [1].

Further details of the DECT system may be found in ETSI TR 101 178 [i.6] and ETSI ETR 043 [i.7].

### National transposition dates

Date of adoption of this EN:	25 September 2017
Date of latest announcement of this EN (doa):	31 December 2017
Date of latest publication of new National Standard or endorsement of this EN (dop/e):	30 June 2018
Date of withdrawal of any conflicting National Standard (dow):	30 June 2019

---

## Modal verbs terminology

In the present document "**shall**", "**shall not**", "**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).

"**must**" and "**must not**" are **NOT** allowed in ETSI deliverables except when used in direct citation.

---

# 1 Scope

The present document is one of the parts of the specification of the Digital Enhanced Cordless Telecommunications (DECT) Common Interface (CI).

This part of the DECT CI specifies the speech and audio coding and transmission requirements.

In order to ensure satisfactory interworking of different portable and fixed units, it is necessary to specify the transmission performance of the analog information over the digital link. This requires not only use of a common speech algorithm, but also standardization of frequency responses, reference speech levels (or loudness) at the air interface and various other parameters.

The present document applies to DECT equipment which includes all the necessary functions to provide real-time two-way speech conversation. Several speech services are defined in the present document, including conventional 3,1 kHz telephony, wideband 7 kHz voice transmission and super-wideband 14 kHz service. DECT Fixed part providing such services may be connected to the public circuit switched (PSTN/ISDN) network, to private networks or to the Internet.

Tethered fixed point local loop applications are not required to comply with the requirements of the present document.

For the DECT systems which connect to the Public Switched Telephone Network (PSTN) via an analog interface, the additional requirements, which are implemented in the FP, have as much as possible been aligned with ETSI TBR 038 [29].

A summary of the control and the use of the DECT echo control functions, to guide on need for options to manufacturers and installers, is found in annex A.

Information concerning test methods can be found in ETSI EN 300 176-1 [9] and ETSI EN 300 176-2 [10] (previously covered by ETSI TBR 010 [i.5]). The test methods take into account that DECT is a digital system.

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.

<https://standards.iteh.ai/catalog/standards/sist/c42a6fa1-ca5a-4a74-862b-7d11ce4d374b/sist-en-300-175-8-v2-7-1-2018>

---

## 2 References

### 2.1 Normative 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.

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

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 necessary for the application of the present document.

- [1] ETSI EN 300 175-1: "Digital Enhanced Cordless Telecommunications (DECT); Common Interface (CI); Part 1: Overview".
- [2] ETSI EN 300 175-2: "Digital Enhanced Cordless Telecommunications (DECT); Common Interface (CI); Part 2: Physical Layer (PHL)".
- [3] ETSI EN 300 175-3: "Digital Enhanced Cordless Telecommunications (DECT); Common Interface (CI); Part 3: Medium Access Control (MAC) layer".
- [4] ETSI EN 300 175-4: "Digital Enhanced Cordless Telecommunications (DECT); Common Interface (CI); Part 4: Data Link Control (DLC) layer".