

ISO/IEC 23003-4:2020-06 (E)

Information technology - MPEG audio technologies - Part 4: Dynamic range control

Contents		Page
Foreword		vi
Introduction		vii
1	Scope	1
2	Normative references	1
3	Terms, definitions and mnemonics	1
3.1	Terms and definitions	1
3.2	Mnemonics	3
4	Symbols (and abbreviated terms)	3
5	Technical overview	4
6	DRC decoder	6
6.1	DRC decoder configuration	6
6.1.1	Overview	6
6.1.2	Description of logical blocks	7
6.1.3	Derivation of peak and loudness values	12
6.2	Dynamic DRC gain payload	16
6.3	DRC set selection	16
6.3.1	Overview	16
6.3.2	Pre-selection based on Signal Properties and Decoder Configuration	17
6.3.3	Selection based on requests	20
6.3.4	Final selection	22
6.3.5	Applying multiple DRC sets	23
6.3.6	Album mode	23
6.3.7	Ducking	23
6.3.8	Precedence	24
6.4	Time domain DRC application	24
6.4.1	Overview	24
6.4.2	Framing	24
6.4.3	Time resolution	25
6.4.4	Time alignment	25
6.4.5	Decoding	26
6.4.6	Gain modifications and interpolation	29
6.4.7	Spline interpolation	35
6.4.8	Look-ahead in decoder	36
6.4.9	Node reservoir	37
6.4.10	Applying the compression	38
6.4.11	Dynamic equalization	41
6.4.12	Multi-band DRC filter bank	43
6.5	Sub-band domain DRC	47
6.6	Generation of DRC gain values at the decoder	51
6.6.1	Overview	51
6.6.2	Description of logical blocks	52
6.6.3	Algorithmic details	53
6.6.4	Combining parametric and non-parametric DRCs	60
6.7	Loudness equalization support	61
6.8	Equalization tool	62

6.8.1	Overview	62
6.8.2	EQ payloads	62
6.8.3	EQ filter elements	63
6.8.4	EQ set selection	64
6.8.5	Application of EQ set	64
6.9	Complexity management	72
6.9.1	General	72
6.9.2	DRC and downmixing complexity estimation	72
6.9.3	EQ complexity estimation	74
6.10	Loudness normalization	75
6.10.1	Overview	75
6.10.2	Loudness normalization based on target loudness	76
6.11	DRC in streaming scenarios	79
6.11.1	DRC configuration	79
6.11.2	Error handling	79
6.12	DRC configuration changes during active processing	79
7	Syntax	81
7.1	Syntax of DRC payload	81
7.2	Syntax of DRC gain payload	81
7.3	Syntax of static DRC payload	82
7.4	Syntax of DRC gain sequence	109
7.5	Syntax of parametric DRC tool	110
7.6	Syntax of equalization tools	117
8	Reference software	131
8.1	Reference software structure	131
8.1.1	General	131
8.2	Bitstream decoding software	131
8.2.1	General	131
8.2.2	MPEG-D DRC decoding software	132
9	Conformance	132
9.1	General	132
9.2	Conformance testing	132
9.2.1	Conformance test data and test procedure	132
9.2.2	Naming conventions	134
9.2.3	File format definitions	136
9.3	Encoder Conformance for MPEG-D DRC bitstreams	138
9.3.1	Characteristics and test procedure	138
9.3.2	Configuration payload	139
9.3.3	Interface payload	153
9.3.4	Frame Payload	156
9.3.5	Requirements depending on profiles and levels	157
9.4	Decoder conformance test categories and conditions	158
9.4.1	General	158
9.4.2	Conformance test categories	158
9.4.3	Conformance test conditions	158
Annex A (normative)	Tables	167
Annex B (normative)	External Interface to DRC tool	207
Annex C (informative)	Audio codec specific information	220
Annex D (informative)	DRC gain generation and encoding	225
Annex E (informative)	DRC set selection and adjustment at decoder	236
Annex F (informative)	Loudness normalization	243
Annex G (informative)	Peak limiter	244

Annex H (informative) Equalization	249
Annex I (normative) Profiles and levels	251
Annex J (informative) Reference software disclaimer	260
Annex K (informative) Reference software	261
Bibliography	262