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ISO 13209-4

Road vehicles — Open Test sequence eXchange format (OTX) —

Part 4: Expanded extensions interface definition

Véhicules routiers — Format public d'échange de séquence-tests (OTX) —

Partie 4: Définition de l'interface des extensions étendues

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Contents

Page

Foreword ... **xiii**

Introduction ... **xv**

1 Scope ... **1**

2 Normative references ... **1**

3 Terms, definitions and abbreviated terms ... **1**
3.1 Terms and definitions ... 1
3.2 Abbreviated terms ... 2

4 Requirements ... **2**
4.1 Basic principles for requirements definition ... 2
4.2 Requirement listing ... 2
4.2.1 Assertion requirements ... 2
4.2.2 BlackBox requirements ... 2
4.2.3 BusMonitoring requirements ... 3
4.2.4 ComInterface requirements ... 3
4.2.5 CommonDialogs requirements ... 3
4.2.6 DataType requirements ... 4
4.2.7 DiagComPlus requirements ... 4
4.2.8 DiagConfiguration requirements ... 5
4.2.9 DiagDataBrowsingPlus requirements ... 5
4.2.10 ECUConfiguration requirements ... 6
4.2.11 EcuStateChart requirements ... 7
4.2.12 EventPlus requirements ... 7
4.2.13 ExternalServiceProvider requirements ... 7
4.2.14 File requirements ... 7
4.2.15 FlashPlus requirements ... 8
4.2.16 Persistence requirements ... 8
4.2.17 Range requirements ... 8
4.2.18 SQL requirements ... 9
4.2.19 StateMachineProcedure requirements ... 9
4.2.20 StateVariable requirements ... 9
4.2.21 TestResultHandling requirements ... 10
4.2.22 Util requirements ... 10
4.2.23 VehicleInfo requirements ... 11
4.2.24 XML requirements ... 11
4.2.25 ZipHandling requirements ... 13

5 Extension overview ... **13**
5.1 General ... 13
5.2 Dependencies ... 14
5.3 OTX packaging (PTX) ... 19

6 OTX Assertion extension ... **19**
6.1 Assertion – General ... 19
6.2 Assertion – Exceptions ... 19
6.2.1 Exceptions overview ... 19
6.2.2 Exceptions syntax ... 19
6.2.3 Exceptions semantics ... 20
6.3 Assertion – Actions ... 20
6.3.1 Actions overview ... 20
6.3.2 Actions syntax ... 20
6.3.3 Actions general semantics ... 21

7 OTX BlackBox extension ... **21**
7.1 BlackBox – General ... 21
7.2 BlackBox – Datatypes ... 21

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7.2.1 Datatypes overview ... 21
7.2.2 Datatypes syntax ... 21
7.2.3 Datatypes semantics ... 22
7.3 BlackBox – Variable access ... 22
7.3.1 Variable access overview ... 22
7.3.2 Variable access syntax ... 22
7.3.3 Variable access semantics ... 23
7.4 BlackBox – Terms ... 23
7.4.1 Terms overview ... 23
7.4.2 Terms syntax ... 23
7.4.3 Terms general semantics ... 24

8 OTX BusMonitoring extension ... 25
8.1 BusMonitoring – General ... 25
8.2 BusMonitoring – Datatypes ... 25
8.2.1 Datatypes overview ... 25
8.2.2 Datatypes syntax ... 25
8.2.3 Datatypes semantics ... 26
8.3 BusMonitoring – Enumerations ... 27
8.3.1 Enumerations syntax ... 27
8.3.2 Enumerations semantics ... 27
8.4 BusMonitoring – Exceptions ... 27
8.4.1 Exceptions overview ... 27
8.4.2 Exceptions syntax ... 28
8.4.3 Exceptions semantics ... 28
8.5 BusMonitoring – Variable access ... 29
8.5.1 Variable access overview ... 29
8.5.2 Variable access syntax ... 29
8.5.3 Variable access semantics ... 29
8.6 BusMonitoring – Actions ... 29
8.6.1 Actions overview ... 29
8.6.2 Actions syntax ... 29
8.6.3 Actions general semantics ... 30
8.7 BusMonitoring – Terms ... 31
8.7.1 Terms overview ... 31
8.7.2 Terms syntax ... 32
8.7.3 Terms general semantics ... 32

9 OTX ComInterface extension ... 38
9.1 ComInterface – General ... 38
9.2 ComInterface – Datatypes ... 38
9.2.1 Datatypes overview ... 38
9.2.2 Datatypes syntax ... 38
9.2.3 Datatypes semantics ... 39
9.3 ComInterface – Enumerations ... 39
9.3.1 Enumerations syntax ... 39
9.3.2 Enumerations semantics ... 40
9.4 ComInterface – Exceptions ... 40
9.4.1 Exceptions overview ... 40
9.4.2 Exceptions syntax ... 40
9.4.3 Exceptions semantics ... 41
9.5 ComInterface – Variable access ... 42
9.5.1 Variable access overview ... 42
9.5.2 Variable access syntax ... 42
9.5.3 Variable access semantics ... 43
9.6 ComInterface – Actions ... 43
9.6.1 Actions overview ... 43
9.6.2 Actions syntax ... 43
9.6.3 Actions general semantics ... 44
9.7 ComInterface – Terms ... 48

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9.7.1 Terms overview 48
9.7.2 Terms syntax 48
9.7.3 Semantics for ComInterface terms 49
9.7.4 Semantics for Enumeration terms 58
9.7.5 Terms general semantics 59

10 OTX CommonDialogs extension 59
10.1 CommonDialogs – General 59
10.2 CommonDialogs – Exceptions 60
10.2.1 Exceptions overview 60
10.2.2 Exceptions syntax 60
10.2.3 Exceptions semantics 60
10.3 CommonDialogs – Actions 60
10.3.1 Actions overview 60
10.3.2 Actions syntax 60
10.3.3 Actions general semantics 61

11 OTX DataType extension 64
11.1 DataType – General 64
11.2 DataType – Datatypes 64
11.2.1 Datatypes overview 64
11.2.2 Datatypes syntax 64
11.2.3 Datatypes semantics 65
11.3 DataType – Exceptions 68
11.3.1 Exceptions overview 68
11.3.2 Exceptions syntax 68
11.3.3 Exceptions semantics 68
11.4 DataType – Variable access 69
11.4.1 Variable access overview 69
11.4.2 Variable access syntax 69
11.4.3 Variable access semantics 69
11.5 DataType – Declaration and arguments 70
11.5.1 Declaration and arguments syntax 70
11.5.2 Declaration and arguments semantics 70
11.6 DataType – Signatures 70
11.6.1 Signatures overview 70
11.6.2 Signatures syntax 71
11.6.3 Semantics for Enumerations 71
11.6.4 Semantics for Structures 72
11.7 DataType – Terms 73
11.7.1 Terms overview 73
11.7.2 Semantics for Enumeration terms 73
11.7.3 Semantics for ResourceLocation terms 77
11.7.4 Semantics for Structure terms 81

12 OTX DiagComPlus extension 85
12.1 DiagComPlus – General 85
12.2 DiagComPlus – Datatypes 85
12.2.1 Datatypes overview 85
12.2.2 Datatypes syntax 85
12.2.3 Datatypes semantics 86
12.3 DiagComPlus – Enumerations 87
12.3.1 Enumerations syntax 87
12.3.2 Enumerations semantics 87
12.4 DiagComPlus – Exceptions 88
12.4.1 Exceptions overview 88
12.4.2 Exceptions syntax 88
12.4.3 Exceptions semantics 88
12.5 DiagComPlus – Variable access 88
12.5.1 Variable access overview 88

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12.5.2 Variable access syntax ... 88
12.5.3 Variable access semantics ... 89
12.6 DiagComPlus – Actions ... 89
12.6.1 Actions overview ... 89
12.6.2 Actions syntax ... 89
12.6.3 Actions general semantics ... 90
12.7 DiagComPlus – Terms ... 93
12.7.1 Terms overview ... 93
12.7.2 Terms syntax ... 93
12.7.3 Terms general semantics ... 94

13 OTX DiagConfiguration extension ... 99
13.1 DiagConfiguration – General ... 99
13.2 DiagConfiguration – Exceptions ... 99
13.2.1 Exceptions overview ... 99
13.2.2 Exceptions syntax ... 99
13.2.3 Exceptions semantics ... 100
13.3 DiagConfiguration – Actions ... 100
13.3.1 Actions overview ... 100
13.3.2 Actions syntax ... 100
13.3.3 Actions general semantics ... 100
13.4 DiagConfiguration – Terms ... 101
13.4.1 Terms overview ... 101
13.4.2 Terms syntax ... 102
13.4.3 Terms general semantics ... 102

14 OTX DiagDataBrowsingPlus extension ... 104
14.1 DiagDataBrowsingPlus – General ... 104
14.2 DiagDataBrowsingPlus – Datatypes ... 104
14.2.1 Datatypes overview ... 104
14.2.2 Datatypes syntax ... 104
14.2.3 Datatypes semantics ... 105
14.3 DiagDataBrowsingPlus – Enumerations ... 109
14.3.1 Enumerations syntax ... 109
14.3.2 Enumerations semantics ... 110
14.4 DiagDataBrowsingPlus – Exceptions ... 113
14.4.1 Exceptions overview ... 113
14.4.2 Exceptions syntax ... 113
14.4.3 Exceptions semantics ... 114
14.5 DiagDataBrowsingPlus – Variable access ... 115
14.5.1 Variable access overview ... 115
14.5.2 Variable access syntax ... 115
14.5.3 Variable access semantics ... 115
14.6 DiagDataBrowsingPlus – Terms ... 116
14.6.1 Terms overview ... 116
14.6.2 Semantics for DbComChannel terms ... 116
14.6.3 Semantics for DbDiagService terms ... 118
14.6.4 Semantics for DbDiagTroubleCode terms ... 124
14.6.5 Semantics for DbEcuVariant terms ... 128
14.6.6 Semantics for DbEnvDataDesc terms ... 129
14.6.7 Semantics for DbFaultMemory terms ... 132
14.6.8 Semantics for DbMatchingParameter terms ... 134
14.6.9 Semantics for DbObject terms ... 135
14.6.10 Semantics for DbParameter terms ... 139
14.6.11 Semantics for DbRequest terms ... 153
14.6.12 Semantics for DbResponse terms ... 157
14.6.13 Semantics for DbSpecialDataElement terms ... 161
14.6.14 Semantics for DbSpecialDataGroup terms ... 163
14.6.15 Semantics for DbSubComponent terms ... 167
14.6.16 Semantics for DbTable terms ... 172

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14.6.17 Semantics for Interval terms ... 177
14.6.18 Semantics for McdDataType terms ... 180
14.6.19 Semantics for McdParameterType terms ... 181
14.6.20 Semantics for McdResponseType terms ... 183
14.6.21 Semantics for Parameter terms ... 185
14.6.22 Semantics for TextTableElement terms ... 188

15 OTX EcuConfiguration extension ... 191
15.1 EcuConfiguration – General ... 191
15.2 EcuConfiguration – Datatypes ... 191
15.2.1 Datatypes overview ... 191
15.2.2 Datatypes syntax ... 192
15.2.3 Datatypes semantics ... 192
15.3 EcuConfiguration – Exceptions ... 193
15.3.1 Exceptions overview ... 193
15.3.2 Exceptions syntax ... 193
15.3.3 Exceptions semantics ... 193
15.4 EcuConfiguration – Variable access ... 194
15.4.1 Variable access overview ... 194
15.4.2 Variable access syntax ... 194
15.4.3 Variable access semantics ... 195
15.5 EcuConfiguration – Actions ... 196
15.5.1 Actions overview ... 196
15.5.2 Actions syntax ... 196
15.5.3 Semantics for ConfigurationRecord actions ... 197
15.5.4 Semantics for ConfigurationRecords actions ... 197
15.5.5 Semantics for OptionItem actions ... 200
15.6 EcuConfiguration – Terms ... 200
15.6.1 Terms overview ... 200
15.6.2 Semantics for ConfigurationRecord terms ... 200
15.6.3 Semantics for ConfigurationRecords terms ... 204
15.6.4 Semantics for DbConfigurationData terms ... 205
15.6.5 Semantics for DbConfigurationRecord terms ... 207
15.6.6 Semantics for DbDataRecord terms ... 210
15.6.7 Semantics for DbItemValue terms ... 213
15.6.8 Semantics for DbOptionItem terms ... 216
15.6.9 Semantics for OptionItem terms ... 223

16 OTX EcuStateChart extension ... 228
16.1 EcuStateChart – General ... 228
16.2 EcuStateChart – Datatypes ... 228
16.2.1 Datatypes overview ... 228
16.2.2 Datatypes syntax ... 228
16.2.3 Datatypes semantics ... 228
16.3 EcuStateChart – Exceptions ... 229
16.3.1 Exceptions overview ... 229
16.3.2 Exceptions syntax ... 229
16.3.3 Exceptions semantics ... 230
16.4 EcuStateChart – Variable access ... 230
16.4.1 Variable access overview ... 230
16.4.2 Variable access syntax ... 230
16.4.3 Variable access semantics ... 230
16.5 EcuStateChart – Terms ... 230
16.5.1 Terms overview ... 230
16.5.2 Semantics for DbEcuState terms ... 231
16.5.3 Semantics for ListTerm related terms ... 233
16.5.4 Semantics for SimpleTerm related terms ... 238
16.5.5 Terms general semantics ... 241

17 OTX EventPlus extension ... 245

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17.1 EventPlus – General ... 245
17.2 EventPlus – Exceptions ... 246
17.2.1 Exceptions overview ... 246
17.2.2 Exceptions syntax ... 246
17.2.3 Exceptions semantics ... 246
17.3 EventPlus – Terms ... 247
17.3.1 Terms overview ... 247
17.3.2 Terms syntax ... 247
17.3.3 Terms general semantics ... 247

18 OTX ExternalServiceProvider extension ... 248
18.1 ExternalServiceProvider – General ... 248
18.2 ExternalServiceProvider – Datatypes ... 249
18.2.1 Datatypes overview ... 249
18.2.2 Datatypes syntax ... 249
18.2.3 Datatypes semantics ... 249
18.3 ExternalServiceProvider – Enumerations ... 250
18.3.1 Enumerations syntax ... 250
18.3.2 Enumerations semantics ... 251
18.4 ExternalServiceProvider – Exceptions ... 251
18.4.1 Exceptions overview ... 251
18.4.2 Exceptions syntax ... 251
18.4.3 Exceptions semantics ... 252
18.5 ExternalServiceProvider – Variable access ... 253
18.5.1 Variable access overview ... 253
18.5.2 Variable access syntax ... 253
18.5.3 Variable access semantics ... 253
18.6 ExternalServiceProvider – Declaration and arguments ... 254
18.6.1 Declaration and arguments syntax ... 254
18.6.2 Declaration and arguments semantics ... 255
18.7 ExternalServiceProvider – Signatures ... 255
18.7.1 Signatures overview ... 255
18.7.2 Signatures syntax ... 255
18.7.3 Signatures general semantics ... 256
18.8 ExternalServiceProvider – Actions ... 262
18.8.1 Actions overview ... 262
18.8.2 Actions syntax ... 262
18.8.3 Actions general semantics ... 264
18.9 ExternalServiceProvider – Terms ... 270
18.9.1 Terms overview ... 270
18.9.2 Terms syntax ... 270
18.9.3 Semantics for Enumeration terms ... 271
18.9.4 Semantics for External Service provider event query terms ... 273
18.9.5 Semantics for External service provider event source terms ... 274
18.9.6 Terms general semantics ... 276

19 OTX File extension ... 279
19.1 File – General ... 279
19.2 File – Datatypes ... 279
19.2.1 Datatypes overview ... 279
19.2.2 Datatypes syntax ... 279
19.2.3 Datatypes semantics ... 280
19.3 File – Exceptions ... 281
19.3.1 Exceptions overview ... 281
19.3.2 Exceptions syntax ... 281
19.3.3 Exceptions semantics ... 282
19.4 File – Variable access ... 282
19.4.1 Variable access overview ... 282
19.4.2 Variable access syntax ... 282
19.4.3 Variable access semantics ... 283

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19.5 File – Actions ... 283
19.5.1 Actions overview ... 283
19.5.2 Actions syntax ... 283
19.5.3 Actions general semantics ... 285
19.6 File – Terms ... 288
19.6.1 Terms overview ... 288
19.6.2 Terms syntax ... 288
19.6.3 Terms general semantics ... 289

20 OTX FlashPlus extension ... 299
20.1 FlashPlus – General ... 299
20.2 FlashPlus – Exceptions ... 299
20.2.1 Exceptions overview ... 299
20.2.2 Exceptions syntax ... 299
20.2.3 Exceptions semantics ... 300
20.3 FlashPlus – Actions ... 300
20.3.1 Actions overview ... 300
20.3.2 Actions syntax ... 300
20.3.3 Actions general semantics ... 301
20.4 FlashPlus – Terms ... 302
20.4.1 Terms overview ... 302
20.4.2 Terms syntax ... 302
20.4.3 Terms general semantics ... 303

21 OTX Persistence extension ... 305
21.1 Persistence – General ... 305
21.2 Persistence – Exceptions ... 306
21.2.1 Exceptions overview ... 306
21.2.2 Exceptions syntax ... 306
21.2.3 Exceptions semantics ... 306
21.3 Persistence – Actions ... 307
21.3.1 Actions overview ... 307
21.3.2 Actions syntax ... 307
21.3.3 Actions general semantics ... 307

22 OTX Range extension ... 308
22.1 Range – General ... 308
22.2 Range – Datatypes ... 308
22.2.1 Datatypes overview ... 308
22.2.2 Datatypes syntax ... 309
22.2.3 Datatypes semantics ... 309
22.3 Range – Enumerations ... 314
22.3.1 Enumerations syntax ... 314
22.3.2 Enumerations semantics ... 314
22.4 Range – Exceptions ... 314
22.4.1 Exceptions overview ... 314
22.4.2 Exceptions syntax ... 315
22.4.3 Exceptions semantics ... 315
22.5 Range – Variable access ... 315
22.5.1 Variable access overview ... 315
22.5.2 Variable access syntax ... 315
22.5.3 Variable access semantics ... 316
22.6 Range – Actions ... 316
22.6.1 Actions overview ... 316
22.6.2 Actions syntax ... 316
22.6.3 Actions general semantics ... 317
22.7 Range – Terms ... 319
22.7.1 Terms overview ... 319
22.7.2 Terms syntax ... 319
22.7.3 Semantics for general terms ... 319

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22.7.4 Semantics for Interval terms ... 328
22.7.5 Semantics for IntervalSemantic terms ... 338
22.7.6 Semantics for Ranged terms ... 340

23 OTX SQL extension ... 346
23.1 SQL – General ... 346
23.2 SQL – Datatypes ... 347
23.2.1 Datatypes overview ... 347
23.2.2 Datatypes syntax ... 347
23.2.3 Datatypes semantics ... 347
23.3 SQL – Exceptions ... 348
23.3.1 Exceptions overview ... 348
23.3.2 Exceptions syntax ... 348
23.3.3 Exceptions semantics ... 348
23.4 SQL – Variable access ... 349
23.4.1 Variable access overview ... 349
23.4.2 Variable access syntax ... 349
23.4.3 Variable access semantics ... 349
23.5 SQL – Actions ... 349
23.5.1 Actions overview ... 349
23.5.2 Actions syntax ... 350
23.5.3 Actions general semantics ... 350
23.6 SQL – Terms ... 352
23.6.1 Terms overview ... 352
23.6.2 Terms syntax ... 352
23.6.3 Terms general semantics ... 353

24 OTX StateMachineProcedure extension ... 359
24.1 StateMachineProcedure – General ... 359
24.2 StateMachineProcedure – Datatypes ... 361
24.2.1 Datatypes overview ... 361
24.2.2 Datatypes syntax ... 361
24.2.3 Datatypes semantics ... 362
24.3 StateMachineProcedure – Procedures ... 364
24.3.1 Procedures overview ... 364
24.3.2 Procedures syntax ... 364
24.3.3 Procedures general semantics ... 365

25 OTX StateVariable extension ... 368
25.1 StateVariable – General ... 368
25.2 StateVariable – Declaration and arguments ... 368
25.2.1 Declaration and arguments syntax ... 368
25.2.2 Declaration and arguments semantics ... 369

26 OTX TestResultHandling extension ... 369
26.1 TestResultHandling – General ... 369
26.2 TestResultHandling – Datatypes ... 370
26.2.1 Datatypes overview ... 370
26.2.2 Datatypes syntax ... 370
26.2.3 Datatypes semantics ... 371
26.3 TestResultHandling – Enumerations ... 373
26.3.1 Enumerations syntax ... 373
26.3.2 Enumerations semantics ... 374
26.4 TestResultHandling – Exceptions ... 375
26.4.1 Exceptions overview ... 375
26.4.2 Exceptions syntax ... 375
26.4.3 Exceptions semantics ... 375
26.5 TestResultHandling – Variable access ... 376
26.5.1 Variable access overview ... 376
26.5.2 Variable access syntax ... 376
26.5.3 Variable access semantics ... 377

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26.6 TestResultHandling – Declaration and arguments 377
26.6.1 Declaration and arguments syntax 377
26.6.2 Declaration and arguments semantics 378
26.7 TestResultHandling – Actions 378
26.7.1 Actions overview 378
26.7.2 Actions syntax 378
26.7.3 Actions general semantics 380
26.8 TestResultHandling – Terms 388
26.8.1 Terms overview 388
26.8.2 Terms syntax 388
26.8.3 Semantics for Enumeration terms 389
26.8.4 Terms general semantics 392

27 OTX Util extension 395
27.1 Util – General 395
27.2 Util – Exceptions 395
27.2.1 Exceptions overview 395
27.2.2 Exceptions syntax 395
27.2.3 Exceptions semantics 396
27.3 Util – Terms 396
27.3.1 Terms overview 396
27.3.2 Terms syntax 397
27.3.3 Semantics for Util terms 398

28 OTX VehicleInfo extension 405
28.1 VehicleInfo – General 405
28.2 VehicleInfo – Datatypes 405
28.2.1 Datatypes overview 405
28.2.2 Datatypes syntax 405
28.2.3 Datatypes semantics 405
28.3 VehicleInfo – Enumerations 406
28.3.1 Enumerations syntax 406
28.3.2 Enumerations semantics 406
28.4 VehicleInfo – Exceptions 406
28.4.1 Exceptions overview 406
28.4.2 Exceptions syntax 406
28.4.3 Exceptions semantics 407
28.5 VehicleInfo – Variable access 407
28.5.1 Variable access overview 407
28.5.2 Variable access syntax 408
28.5.3 Variable access semantics 408
28.6 VehicleInfo – Terms 408
28.6.1 Terms overview 408
28.6.2 Terms syntax 408
28.6.3 Terms general semantics 409

29 OTX XML extension 411
29.1 XML – General 411
29.2 XML – Datatypes 412
29.2.1 Datatypes overview 412
29.2.2 Datatypes syntax 412
29.2.3 Datatypes semantics 412
29.3 XML – Exceptions 412
29.3.1 Exceptions overview 412
29.3.2 Exceptions syntax 413
29.3.3 Exceptions semantics 413
29.4 XML – Variable access 414
29.4.1 Variable access overview 414
29.4.2 Variable access syntax 414
29.4.3 Variable access semantics 414

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29.5 XML – Actions 414
29.5.1 Actions overview 414
29.5.2 Actions syntax 414
29.5.3 Actions general semantics 415
29.6 XML – Terms 421
29.6.1 Terms overview 421
29.6.2 Terms syntax 421
29.6.3 Terms general semantics 423

30 OTX ZipHandling extension 429
30.1 ZipHandling – General 429
30.2 ZipHandling – Exceptions 429
30.2.1 Exceptions overview 429
30.2.2 Exceptions syntax 429
30.2.3 Exceptions semantics 430
30.3 ZipHandling – Actions 431
30.3.1 Actions overview 431
30.3.2 Actions syntax 431
30.3.3 Actions general semantics 432

Annex A (normative) **Comprehensive checker rule listing 437**

Annex B (normative) **PTX file 447**

Annex C (informative) **diagValidationGroups 456**

Bibliography 457

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Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular, the different approval criteria needed for the different types of ISO document should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2 (see www.iso.org/directives).

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For an explanation of the voluntary nature of standards, the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the World Trade Organization (WTO) principles in the Technical Barriers to Trade (TBT), see www.iso.org/iso/foreword.html.

This document was prepared by Technical Committee ISO/TC 22, Road vehicles, Subcommittee SC 31, Data communication.

This second edition cancels and replaces the first edition (ISO 13209-4:2021), which has been technically revised.

The main changes are as follows:

— **ComInterface** extension: added ability to select interfaces and control security access for DoIP, harmonized order of the **ConnectionStates** enumeration;

— **DataType** extension: added initialization of Structures, StructureLiterals and addition of MIME types for Resource Locations;

— **DiagComPlus** extension: added terms to access timestamps for Requests and Responses, and support of Inline-Mapping outside of diagnostic services. Harmonized order of the **ComChannelState** enumeration;

— **DiagDataBrowsingPlus** extension: **IsDiagTroubleCodeParameter** term added;

— **EcuConfiguration** extension: completely re-designed for a more generic approach to accessing configuration data;

— **FlashPlus** extension: new action **TransferSegment** added;

— **Util** extension: new term **EscapeToRegularExpression** added;

— **StateVariable** extension: state variables modified from Write-only to No-reading across documents. The whole extension is DEPRECATED!

— **XML** extension: New Action **ValidateXMLFromByteField** added;

— Correction and clarification of the documentation text in all extensions.

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This edition is not backward compatible with the previous one, because terms are deleted and term parameters are modified.

The incompatible changes are as follows:

— **ExternalServiceProvider** extension: parameter **providerType** added to **GetServiceProviderFromEvent,** to ensure type safety.

Additionally the following new extensions are introduced:

— **Range;**

— **EcuStateChart.**

A list of all parts in the ISO 13209 series can be found on the ISO website.

Any feedback or questions on this document should be directed to the user's national standards body. A complete listing of these bodies can be found at www.iso.org/members.html.

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Introduction

Diagnostic test sequences are utilized whenever automotive components or functions with diagnostic abilities are being diagnosed, tested, reprogrammed or initialized by off-board test equipment. Test sequences define the succession of interactions between the user (i.e. workshop or assembly line staff), the diagnostic application (the test equipment) and the vehicle communication interface as well as any calculations and decisions that have to be carried out. Test sequences provide a means to define interactive, guided diagnostics or similar test logic.

Today, the automotive industry mainly relies on paper documentation and/or proprietary authoring environmments to document and to implement such test sequences for a specific test application. An author who is setting up engineering, assembly line or service diagnostic test applications implements the required test sequences manually, supported by non-uniform test sequence documentation, most likely using different authoring applications and formats for each specific test application. This redundant effort can be greatly reduced if processes and tools support the OTX concept.

The ISO 13209 series proposes an open and standardized format for the human- and machine-readable description of diagnostic test sequences. The format supports the requirements of transferring diagnostic test sequence logic uniformly between electronic system suppliers, vehicle manufacturers and service dealerships/repair shops.

This document extends the core of the ISO 13209 series with a set of additional, generally usable OTX extensions which are not part of ISO 13209-3, using the extension mechanism rules described in ISO 13209-2.

Figure 1 gives an overview of the additional extensions (marked in black) related to the existing extensions in ISO 13209-3 (marked in white).

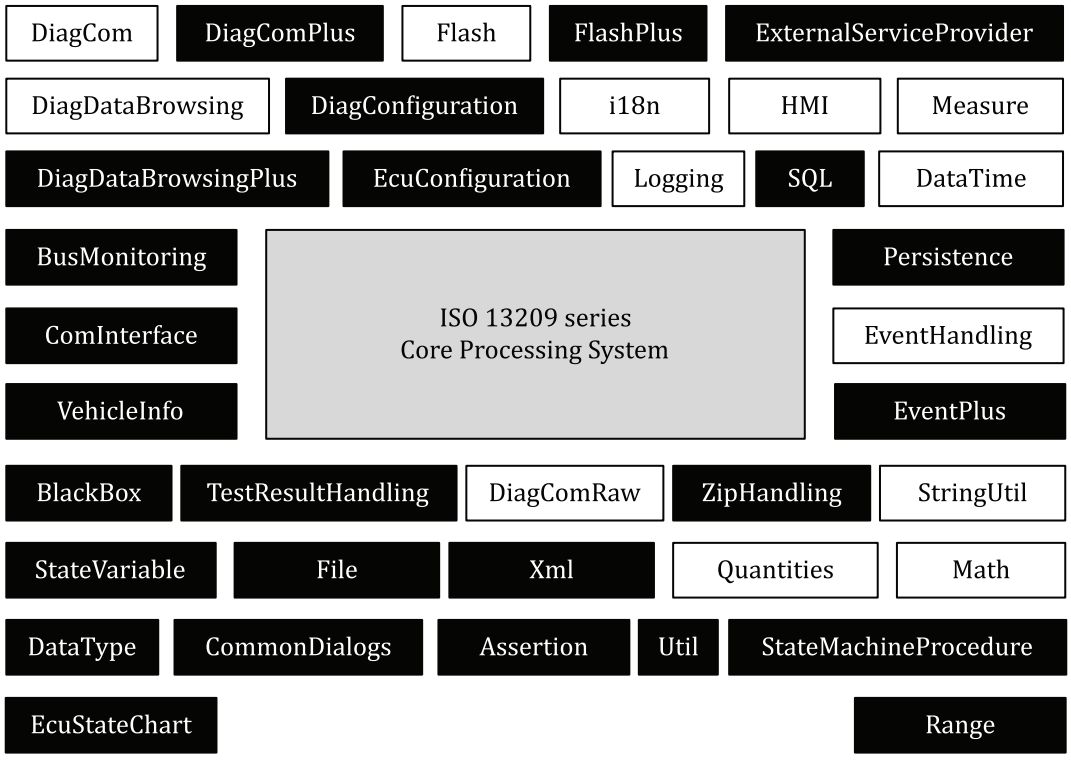


Figure 1 — OTX extensions overview

The main goals are:

— enlargement of the field of application,

— ensuring exchangeability between different tools and suppliers,

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— improvement of OTX code quality,

— improvement of standard acceptance.

The following common requirements are covered:

— general read-write access to files,

— XML processing,

— declare data, whose internal properties are unknown,

— deep change monitoring in lists or maps,

— store arbitrary information on the current runtime,

— handling of user-defined data types: structure and enumeration,

— ensure correct implementation of OTX test sequences,

— support of DoIP,

— configuration tasks,

— browsing of ODX database,

— extend OTX to functionality that is encapsulated in external services, part of a system, a device, a database or a simple library,

— functional access to ECUs,

— capturing, evaluating and persisting results of test sequences,

— transport status information from inside a sequence to the environment,

— advanced convenience functionality,

— collection of communication data at runtime,

— select and modify project and vehicle information's for MVCI systems,

— support of variant coding,

— enable late bound flashing of ECUs,

— access to SQL databases,

— evaluating test sequence results in a structured way,

— access to information about vehicle network architecture,

— state machine,

— compressed data exchange.

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Road vehicles — Open Test sequence eXchange format (OTX) —

Part 4:
Expanded extensions interface definition

1 Scope

This document defines the Open Test sequence eXchange (OTX) additional extension requirements and data model specifications.

The requirements are derived from the use cases described in ISO 13209-1. They are listed in Clause 4.

The data model specification aims at an exhaustive definition of all features of the OTX extensions which have been implemented to satisfy the requirements. This document establishes rules for the syntactical entities of each extension. Each of these syntactical entities is accompanied by semantic rules which determine how OTX documents containing extension features are interpreted. The syntax rules are provided by UML[2] class diagrams and XML schemas, whereas the semantics are given by UML activity diagrams and prose definitions.

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ISO 13209-1, *Road vehicles — Open Test sequence eXchange format (OTX) — Part 1: General information and use cases*

ISO 13209-2:2022, *Road vehicles — Open Test sequence eXchange format (OTX) — Part 2: Core data model specification and requirements*

ISO 13209-3:2022, *Road vehicles — Open Test sequence eXchange format (OTX) — Part 3: Standard extensions and requirements*

ISO 22900-3:2012, *Road vehicles — Modular vehicle communication interface (MVCI) — Part 3: Diagnostic server application programming interface (D-Server API)*

3 Terms, definitions and abbreviated terms

3.1 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO 13209-1 and ISO 13209-2 apply.

ISO and IEC maintain terminological databases for use in standardization at the following addresses:

— ISO Online browsing platform: available at https://www.iso.org/obp

— IEC Electropedia: available at https://www.electropedia.org/

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