ISO 10303-232:2002-06 (E)

Industrial automation systems and integration - Product data representation and e xchange - Part 232: Application protocol: Technical data packaging core information and exchange

Contents

Page

1 Scope 1
2 Normative references 4
3 Terms, definitions, and abbreviations 7
3.5 Other terms and definitions 10
3.6 Abbreviations 14
4 Information requirements 15
4.1 Units of functionality 16
4.1.1 data_definition_exchange 26
4.1.2 data_list 31
4.1.3 drawing 34
4.1.4 indentured_data_list 36
4.1.5 index_list 40
4.1.6 other_list 42
4.1.7 parts_list 45
4.1.8 presentation 49
4.1.9 product_data_set 51
4.1.10 reference_document 54
4.2 Application objects 55
4.3 Application assertions 239
5 Application interpreted model 310
5.1 Mapping table 310
5.2 AIM EXPRESS short listing 939
6 Conformance requirements 1018
6.1 Data definition exchange for files, conformance class 1 1021
6.2 Data definition exchange for TDP elements, conformance class 2 1021
6.3 Data definition exchange for indentured methods, conformance class 3 1021
6.4 Parts list, conformance class 4 1021
6.5 Data list, conformance class 5 1021
6.6 Indentured data list, conformance class 6 1022
6.7 Index list, conformance class 7 1022
6.8 Other list, conformance class 8 1022
6.9 List with presentation, conformance class 9 1022
6.10 Reference document identification and drawing identification, Conformance Class 10 .
1022 6.12 Product data set (PDS) without presentation format, Conformance Class 12 .1023
6.13 Product data set (PDS) with shading, conformance class 13 1024
6.14 Product data set (PDS) with presentation format, conformance class 14 1024
Annex A (normative) AIM EXPRESS expanded listing 1045
Annex B (normative) AIM short names of entities 1206
Annex C (normative) Implementation method specific requirements 1219
Annex D (normative) Protocol implementation conformance statement (PICS) proforma 1223

Annex E (normative) Information object registration 1225

E.1 Document identification 1225
E.2 Schema identification 1225

Annex F (informative) Application activity model 1226

F.1 Application activity model definitions 1227
F.2 Application activity model abbreviations 1248
F.3 Application activity model diagrams 1250

Annex G (informative) Application reference model 1268

Annex H (informative) AIM EXPRESS-G 1306

Annex J (informative) Computer-interpretable listings 1373

Annex K (informative) Usage Scenarios 1374

K.1 Information exchange scenarios 1374
K.2 Definitions and levels of capability for the parts list 1381
K.3 Definitions and levels of capability for the data list 1402
K.4 Definitions and levels of capability for the index list 1417
K.5 Definitions and levels of capability for the Data Definition Exchange 1429
K.6 Definitions and levels of capability for the indentured data list 1455

Bibliography 1479

Index 1480

Figures Figure 2 -- High level planning model xii

Figure 3 -- Functional usage of technical data 2

Figure 4 -- Format style for date 70

Figure 5 -- Graphics utilized in presenting a tabulated listing 179

Figure 6 -- Page anchor location 180

Figure 7 -- Standard cross sections 225

Figure F.1 -- A-0: develop, procure, build, use, and maintain a product 1251

Figure F.2 -- A0: develop, procure, build, use, and maintain a product 1252

Figure F.3 -- A2: manage, design, and support a product 1253

Figure F.4 -- A22: design and analyze a product 1254

Figure F.5 -- A223: perform product detail and design analysis 1255

Figure F.6 -- A2232: create detail product design 1256

Figure F.7 -- A22323: prepare product models and drawings 1257

Figure F.8 -- A223232: create product layouts and models 1258

Figure F.9 -- A223233: create product drawing data 1259

Figure F.10 -- A2232332: prepare detail product item drawings 1260

Figure F.11 -- A22324: build product associated lists 1261

Figure F.12 -- A24: prepare product data for use 1262

Figure F.13 -- A3: use and maintain a product 1263

Figure F.14 -- A33: support product 1264

Figure F.15 -- A331: spares procurement 1265

Figure F.16 -- A223: local manufacture 1266

Figure F.17 -- A333: develop modifications 1267

Figure G.1 -- ARM diagram (1 of 33) 1273

Figure G.2 -- ARM diagram (2 of 33) 1274

Figure G.3 -- ARM diagram (3 of 33) 1275

Figure G.4 -- ARM diagram (4 of 33) 1276

Figure G.5 -- ARM diagram (5 of 33) 1277

Figure G.6 -- ARM diagram (6 of 33) 1278

Figure G.7 -- ARM diagram (7 of 33) 1279

Figure G.8 -- ARM diagram (8 of 33) 1280

Figure G.9 -- ARM diagram (9 of 33) 1281

Figure G.10 -- ARM diagram (10 of 33) 1282

Figure G.11 -- ARM diagram (11 of 33) 1283

Figure G.12 -- ARM diagram (12 of 33) 1284

Figure G.13 -- ARM diagram (13 of 33) 1285

Figure G.14 -- ARM diagram (14 of 33) 1286

Figure G.15 -- ARM diagram (15 of 33) 1287

Figure G.16 -- ARM diagram (16 of 33) 1288

Figure G.17 -- ARM diagram (17 of 33) 1289

Figure G.18 -- ARM diagram (18 of 33) 1290

Figure G.19 -- ARM diagram (19 of 33) 1291

Figure G.20 -- ARM diagram (20 of 33) 1292

Figure G.21 -- ARM diagram (21 of 33) 1293

Figure G.22 -- ARM diagram (22 of 33) 1294

Figure G.23 -- ARM diagram (23 of 33) 1295

Figure G.24 -- ARM diagram (24 of 33) 1296

Figure G.25 -- ARM diagram (25 of 33) 1297

Figure G.26 -- ARM diagram (26 of 33) 1298

Figure G.27 -- ARM diagram (27 of 33) 1299

Figure G.28 -- ARM diagram (28 of 33) 1300

Figure G.29 -- ARM diagram (29 of 33) 1301

Figure G.30 -- ARM diagram (30 of 33) 1302

Figure G.31 -- ARM diagram (31 of 33) 1303

Figure G.32 -- ARM diagram (32 of 33) 1304

Figure G.33 -- ARM diagram (33 of 33) 1305

Figure H.1 -- AIM EXPRESS-G diagram (1 of 66) 1307

Figure H.2 -- AIM EXPRESS-G diagram (2 of 66) 1308

Figure H.3 -- AIM EXPRESS-G diagram (3 of 66) 1309

Figure H.4 -- AIM EXPRESS-G diagram (4 of 66) 1310

Figure H.5 -- AIM EXPRESS-G diagram (5 of 66) 1311

Figure H.6 -- AIM EXPRESS-G diagram (6 of 66) 1312

Figure H.7 -- AIM EXPRESS-G diagram (7 of 66) 1313

Figure H.8 -- AIM EXPRESS-G diagram (8 of 66) 1314

Figure H.9 -- AIM EXPRESS-G diagram (9 of 66) 1315

Figure H.10 -- AIM EXPRESS-G diagram (10 of 66) 1316

Figure H.11 -- AIM EXPRESS-G diagram (11 of 66) 1317

Figure H.12 -- AIM EXPRESS-G diagram (12 of 66) 1318

Figure H.13 -- AIM EXPRESS-G diagram (13 of 66) 1319

Figure H.14 -- AIM EXPRESS-G diagram (14 of 66) 1320

Figure H.15 -- AIM EXPRESS-G diagram (15 of 66) 1321

Figure H.16 -- AIM EXPRESS-G diagram (16 of 66) 1322

Figure H.17 -- AIM EXPRESS-G diagram (17 of 66) 1323

Figure H.18 -- AIM EXPRESS-G diagram (18 of 66) 1324

Figure H.19 -- AIM EXPRESS-G diagram (19 of 66) 1325

Figure H.20 -- AIM EXPRESS-G diagram (20 of 66) 1326

Figure H.21 -- AIM EXPRESS-G diagram (21 of 66) 1327

Figure H.22 -- AIM EXPRESS-G diagram (22 of 66) 1328

Figure H.23 -- AIM EXPRESS-G diagram (23 of 66) 1329

Figure H.24 -- AIM EXPRESS-G diagram (24 of 66) 1330

Figure H.25 -- AIM EXPRESS-G diagram (25 of 66) 1331

Figure H.26 -- AIM EXPRESS-G diagram (26 of 66) 1332

Figure H.27 -- AIM EXPRESS-G diagram (27 of 66) 1333

Figure H.28 -- AIM EXPRESS-G diagram (28 of 66) 1334

Figure H.29 -- AIM EXPRESS-G diagram (29 of 66) 1335

Figure H.30 -- AIM EXPRESS-G diagram (30 of 66) 1336

Figure H.31 -- AIM EXPRESS-G diagram (31 of 66) 1337

Figure H.32 -- AIM EXPRESS-G diagram (32 of 66) 1338

Figure H.33 -- AIM EXPRESS-G diagram (33 of 66) 1339

Figure H.34 -- AIM EXPRESS-G diagram (34 of 66) 1340

Figure H.35 -- AIM EXPRESS-G diagram (35 of 66) 1341

Figure H.36 -- AIM EXPRESS-G diagram (36 of 66) 1342

Figure H.37 -- AIM EXPRESS-G diagram (37 of 66) 1343

Figure H.38 -- AIM EXPRESS-G diagram (38 of 66) 1344

Figure H.39 -- AIM EXPRESS-G diagram (39 of 66) 1345

Figure H.40 -- AIM EXPRESS-G diagram (40 of 66) 1346

Figure H.41 -- AIM EXPRESS-G diagram (41 of 66) 1347

Figure H.42 -- AIM EXPRESS-G diagram (42 of 66) 1348

Figure H.43 -- AIM EXPRESS-G diagram (43 of 66) 1349

Figure H.44 -- AIM EXPRESS-G diagram (44 of 66) 1350

Figure H.45 -- AIM EXPRESS-G diagram (45 of 66) 1351

Figure H.46 -- AIM EXPRESS-G diagram (46 of 66) 1352

Figure H.47 -- AIM EXPRESS-G diagram (47 of 66) 1353

Figure H.48 -- AIM EXPRESS-G diagram (48 of 66) 1354

Figure H.49 -- AIM EXPRESS-G diagram (49 of 66) 1355

Figure H.50 -- AIM EXPRESS-G diagram (50 of 66) 1356

Figure H.51 -- AIM EXPRESS-G diagram (51 of 66) 1357

Figure H.52 -- AIM EXPRESS-G diagram (52 of 66) 1358

Figure H.53 -- AIM EXPRESS-G diagram (53 of 66) 1359

Figure H.54 -- AIM EXPRESS-G diagram (54 of 66) 1360

Figure H.55 -- AIM EXPRESS-G diagram (55 of 66) 1361

Figure H.56 -- AIM EXPRESS-G diagram (56 of 66) 1362

Figure H.57 -- AIM EXPRESS-G diagram (57 of 66) 1363

Figure H.58 -- AIM EXPRESS-G diagram (58 of 66) 1364

Figure H.59 -- AIM EXPRESS-G diagram (59 of 66) 1365

Figure H.60 -- AIM EXPRESS-G diagram (60 of 66) 1366

Figure H.61 -- AIM EXPRESS-G diagram (61 of 66) 1367

Figure H.62 -- AIM EXPRESS-G diagram (62 of 66) 1368

Figure H.63 -- AIM EXPRESS-G diagram (63 of 66) 1369

Figure H.64 -- AIM EXPRESS-G diagram (64 of 66) 1370

Figure H.65 -- AIM EXPRESS-G diagram (65 of 66) 1371

Figure H.66 -- AIM EXPRESS-G diagram (66 of 66) 1372

Figure K.1 -- TDP information exchange activity 1375

Figure K.2 -- Information creation scenario for TDP development 1378

Tables Table 1 -- Applicability of selects and enumerations to units of functionality 17

Table 2 -- Applicability of types and entities to the units of functionality 18

Table 3 -- Change_identification attribute relationships 68

Table 4 -- Mapping table for common 312

Table 5 -- Mapping table for data_definition_exchange 389

Table 6 -- Mapping table for data_list 519

Table 7 -- Maping table for drawing 566

Table 8 -- Mapping table for indentured_data_list 594

Table 9 -- Mapping table for index_list 694

Table 10 -- Mapping table for other_list 719

Table 11 -- Mapping table for parts_list 749

Table 12 -- Mapping table for presentation 853

Table 13 -- Mapping table for product_data_set 874

Table 14 -- Mapping table for reference_document 931

Table 15 -- Conformance classes 1019

Table 16 -- Conformance class elements 1024

Table K.2.1 -- Levels of capability for PL selects and enumerations 1383

Table K.2.2 -- Levels of capability for PL application objects and attributes 1384

Table K.3.1 -- Levels of capability for DL selects and enumerations 1404

Table K.3.2 -- Levels of capability for DL application objects and attributes 1405

Table K.4.1 -- Levels of capability for IL selects and enumerations 1419

Table K.4.2 -- Levels of capability for IL application objects and attributes 1419

Table K.5.1 -- Parent child relationships used in indenture list types 1432

Table K.5.2 -- Levels of capability for DDE, selects, and enumerations 1435

Table K.5.3 -- Levels of capability for DDE application objects and attributes 1438

Table K.6.1 -- Parent child relationships used in indenture list types 1458

Table K.6.2 -- Levels of capability for IDL selects, and enumerations 1461

Table K.6.3 -- Levels of capability for IDL application objects and attributes 1463