

INTERNATIONAL STANDARD

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**Industrial communication networks – Fieldbus specifications –
Part 5-10: Application layer service definition – Type 10 elements**

**Réseaux de communication industriels – Spécifications des bus de terrain –
Partie 5-10: Définition des services de la couche application – Éléments de
type 10**



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INTERNATIONAL
ELECTROTECHNICAL
COMMISSION

COMMISSION
ELECTROTECHNIQUE
INTERNATIONALE

ICS 25.040.40, 35.100.70, 35.110

ISBN 978-2-8322-7871-0

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CONTENTS

FOREWORD.....	17
INTRODUCTION.....	19
1 Scope.....	20
1.1 General.....	20
1.2 Specifications	21
1.3 Conformance	21
2 Normative references	21
3 Terms, definitions, abbreviated terms, symbols and conventions	24
3.1 Referenced terms and definitions.....	24
3.1.1 ISO/IEC 7498-1 terms.....	24
3.1.2 ISO/IEC 8822 terms.....	25
3.1.3 ISO/IEC 9545 terms.....	25
3.1.4 ISO/IEC 8824-1 terms.....	25
3.2 Additional Type 10 terms and definitions.....	25
3.3 Additional Type 10 terms and definitions for media redundancy.....	33
3.4 Abbreviations and symbols	34
3.4.1 General	34
3.4.2 Additional Type 10 abbreviations and symbols.....	37
3.4.3 Abbreviations and symbols for services	40
3.4.4 Void.....	40
3.5 Conventions.....	40
3.5.1 Overview	40
3.5.2 General conventions.....	41
3.5.3 Conventions for class definitions	41
3.5.4 Conventions for service definitions	42
3.5.5 Conventions used in state machines.....	43
4 Concepts.....	43
5 Data type ASE.....	44
5.1 General.....	44
5.1.1 Overview.....	44
5.1.2 Date and time type specifics.....	44
5.1.3 Transfer of user data	44
5.1.4 Data type overview	44
5.2 Formal definition of data type objects.....	47
5.2.1 Data type class.....	47
5.3 FAL defined data types	49
5.3.1 Fixed length types	49
5.3.2 Variable Length types	71
5.4 Data type ASE service specification.....	74
6 Communication model for common services	74
6.1 Concepts	74
6.1.1 General	74
6.1.2 Structure of an end station.....	75
6.1.3 Structure of a bridged end station.....	76
6.1.4 Structure of a bridge.....	77
6.1.5 Examples of stations	78

6.1.6	Automation system	79
6.2	ASE data types	80
6.3	ASEs	80
6.3.1	Middle Layer ASEs	80
6.3.2	Remote procedure call ASE	81
6.3.3	Remote service interface ASE	90
6.3.4	Domain name system ASE	103
6.3.5	Simple network management ASE	104
6.3.6	NETCONF ASE	107
6.3.7	NETCONF event ASE	108
6.3.8	IP suite ASE	109
6.3.9	Real time cyclic ASE	113
6.3.10	Real time acyclic ASE	130
6.3.11	Discovery and basic configuration ASE	140
6.3.12	Dynamic host configuration ASE	173
6.3.13	IEEE Std 802.1AB ASE	175
6.3.14	Media redundancy ASE	189
6.3.15	Precision time control ASE	196
6.3.16	IEEE Std 802.1AS ASE	210
6.3.17	IEEE Std 802.1Q ASE	214
6.3.18	IEEE Std 802.1CB ASE	230
6.3.19	Fragmentation ASE	236
6.3.20	IEEE Std 802.3 ASE	238
6.3.21	Void	241
6.3.22	Common DL mapping ASE	241
6.4	Additional information	248
7	Communication model for distributed systems	248
7.1	Concepts	248
7.1.1	User requirements	248
7.1.2	Features	248
7.1.3	Associations	249
7.1.4	Device types	250
7.1.5	Instance model and device addresses	260
7.1.6	Application process	260
7.1.7	Application service element	268
7.1.8	Application relationship	270
7.2	ASE data types	270
7.3	ASEs	271
7.3.1	AR ASE	271
7.3.2	Real Identification ASE	409
7.3.3	CIM ASE	502
7.3.4	Diagnosis ASE	604
7.3.5	PE ASE	652
7.3.6	LogBook ASE	662
7.3.7	RS ASE	665
7.3.8	Time ASE	690
7.3.9	NME ASE	695
7.4	Application characteristics	734
7.4.1	Device Ident Number	734

7.4.2	Network topology	735
7.5	Summary of FAL services	736
7.5.1	IO device	736
7.5.2	IO controller	737
7.5.3	IO supervisor	738
Annex A (informative)	Device instances	739
Annex B (informative)	Components of an Ethernet interface	741
Annex C (informative)	Scheme of MAC address assignment	745
Annex D (informative)	Measurement of the fast startup time	746
Annex E (informative)	Dynamic Frame Packing	747
Annex F (informative)	Precondition for Diagnosis	753
Bibliography	761
Figure 1	– Structure of an automation station	74
Figure 2	– Overall view of communication ASEs	75
Figure 3	– Structure of an end station	76
Figure 4	– Structure of a bridged end station	77
Figure 5	– IEEE Std 802 station example 1 (end station and bridge configuration portion)	78
Figure 6	– IEEE Std 802 station example 3	79
Figure 7	– IEEE Std 802 station example 4	79
Figure 8	– Automation system example	80
Figure 9	– Middle Layer ASEs communication architecture	80
Figure 10	– Sequence Chart for reading the EndPointMapper	83
Figure 11	– Media redundancy diagnosis dependencies	195
Figure 12	– PTCP applications	196
Figure 13	– Example of periods at a local port	227
Figure 14	– Example of communication between controlling devices and field devices	249
Figure 15	– Example of communication between an engineering station and several controlling and field devices	250
Figure 16	– Example of communication between field devices and a server station	250
Figure 17	– Example of communication between field devices	250
Figure 18	– Interfaces, components and ports	251
Figure 19	– Multiple interfaces, components and ports	252
Figure 20	– Multiple interfaces, one bridge component with one external port	253
Figure 21	– Multiple interfaces, multiple bridge components	253
Figure 22	– Data Objects and Diagnosis Data Model	257
Figure 23	– Example for channel modelling	258
Figure 24	– Mapping to device model	259
Figure 25	– Identification hierarchy	259
Figure 26	– Application Process with application process objects (APOs)	261
Figure 27	– Access to a remote APO	262
Figure 28	– Access to a remote APO for provider/consumer association	263
Figure 29	– Overview of application processes	264

Figure 30 – IO device with APs, slots and subslots	264
Figure 31 – Example 1 structural units for interfaces and ports within API 0.....	267
Figure 32 – Example 2 structural units for interfaces and ports within API 0.....	267
Figure 33 – FAL ASEs communication architecture.....	268
Figure 34 – Example of one AR with two AREPs.....	270
Figure 35 – Example IO application relationship (one-to-one)	273
Figure 36 – Example IO application relationship one-to-many	274
Figure 37 – Implicit application relationship	275
Figure 38 – State transition diagram DEVSM	308
Figure 39 – State transition diagram CTLSM.....	313
Figure 40 – Assignment of Communication Relationship to Application Relationship.....	321
Figure 41 – Overview Communication Relationship Class service interactions	324
Figure 42 – Example for an intersection of IO device, slot, and AR	387
Figure 43 – Substitute Value.....	417
Figure 44 – State transition diagram RSMSM.....	425
Figure 45 – Ownership handling.....	428
Figure 46 – State transition diagram OWNSM.....	431
Figure 47 – State transition diagram ASSSM	431
Figure 48 – State transition diagram PLUGSM.....	443
Figure 49 – State transition diagram PULLSM.....	446
Figure 50 – Location concepts in Asset Management.....	461
Figure 51 – Basic model for isochronous application.....	476
Figure 52 – General isochronous application model (example CACF == 1)	477
Figure 53 – General isochronous application model (example CACF == 2)	478
Figure 54 – ASE relations in an IO device operating in isochronous mode for a submodule	484
Figure 55 – State transition diagram of ISOM_SYNC	486
Figure 56 – State transition diagram ISOM_OUT	489
Figure 57 – State transition diagram ISOM_IN	494
Figure 59 – CIM overview	503
Figure 60 – CIM class principle.....	504
Figure 61 – MxM Interconnection	588
Figure 62 – State transition diagram SYNC_DIAG.....	599
Figure 63 – Diagnosis Base Model.....	605
Figure 64 – Filtering of diagnosis	606
Figure 65 – Filtering hierarchy	606
Figure 66 – Severity classification of fault, maintenance and qualified	607
Figure 67 – Data Base Model.....	608
Figure 68 – State transition diagram DIAG_DIAG.....	638
Figure 69 – State transition diagram DIAG_MR.....	641
Figure 70 – State transition diagram DIAG_MD.....	645
Figure 71 – State transition diagram DIAG_QUALIFIED	649
Figure 72 – Architecture.....	653

Figure 73 – State transition diagram PESM.....	661
Figure 74 – Reporting System components.....	666
Figure 75 – AR / ARSet and Reporting System.....	667
Figure 76 – Max Scan Delay.....	675
Figure 77 – RS Incident window.....	678
Figure 78 – State transition diagram RSOBS.....	683
Figure 79 – State transition diagram RSBUF.....	687
Figure 80 – State transition diagram TimeSM.....	693
Figure 81 – Layers from application to network.....	696
Figure 82 – Assumed application timing model.....	696
Figure 83 – Relations of the IO controller to the Network Management Engine.....	697
Figure 84 – Relations of the IO device to the Network Management Engine.....	698
Figure 85 – Relations of a standalone Network Management Engine.....	698
Figure 86 – Correlation of the Stream Add parameter.....	704
Figure 87 – Interaction of the NME class.....	711
Figure 88 – Interaction of the NCE class.....	714
Figure 89 – Interaction of the TDE class.....	717
Figure 90 – Interaction of the PCE class.....	724
Figure 91 – Interaction of the BNME class.....	727
Figure 92 – Interaction between NME instance and BMM instance.....	727
Figure 93 – Interaction of the NUE class.....	734
Figure 94 – Example of network topology including power wireless segments.....	735
Figure 95 – Example of media redundancy including wireless segments.....	736
Figure A.1 – Instance model in conjunction with CLRPC.....	739
Figure A.2 – Instance model in conjunction with RSI.....	740
Figure B.1 – Scheme of an Ethernet interface.....	741
Figure B.2 – Scheme of an Ethernet interface with bridging ability.....	742
Figure B.3 – Scheme of an Ethernet interface with optical ports.....	743
Figure B.4 – Scheme of an Ethernet interface with bridging ability using radio communication.....	744
Figure B.5 – Scheme of an Ethernet interface with radio communication.....	744
Figure C.1 – Scheme of MAC address assignment.....	745
Figure D.1 – Measurement of the fast startup time.....	746
Figure E.1 – Frame Layout.....	747
Figure E.2 – Subframe Layout.....	748
Figure E.3 – End to End.....	749
Figure E.4 – Dynamic frame packing.....	749
Figure E.5 – Dynamic frame packing – Truncation of outputs.....	750
Figure E.6 – Dynamic frame packing – Outbound Pack.....	750
Figure E.7 – Dynamic frame packing – Concatenation of inputs.....	751
Figure E.8 – Dynamic frame packing – Inbound Pack.....	752
Figure E.9 – Dynamic frame packing – Distributed watchdog.....	754
Figure E.10 – Interrelation between IO CR and dynamically packed frame.....	754

Table 1 – Data type overview.....	45
Table 2 – V2 octets.....	49
Table 3 – L2 octets.....	50
Table 4 – E2 octets.....	51
Table 5 – E2 value range.....	51
Table 6 – Unipolar2.16 octets.....	51
Table 7 – Unipolar2.16 value range.....	51
Table 8 – N2 value range.....	53
Table 9 – N4 value range.....	54
Table 10 – X2 value range.....	55
Table 11 – X4 value range.....	56
Table 12 – C4 value range.....	56
Table 13 – T2 value range.....	58
Table 14 – T4 value range.....	59
Table 15 – D2 value range.....	60
Table 16 – R2 value range.....	60
Table 17 – TimeStamp status value range.....	62
Table 18 – TimeStampDifference status value range.....	63
Table 19 – F message trailer with 4 octets.....	66
Table 20 – Unsigned16_S octets.....	68
Table 21 – Unsigned16_S meaning.....	69
Table 22 – Integer16_S octets.....	69
Table 23 – Integer16_S meaning.....	69
Table 24 – Unsigned8_S octets.....	70
Table 25 – Unsigned8_S meaning.....	70
Table 26 – OctetString_S octets.....	71
Table 27 – OctetString_S status bits.....	72
Table 28 – RPC Connect.....	84
Table 29 – RPC Release.....	85
Table 30 – RPC Read.....	86
Table 31 – RPC Write.....	87
Table 32 – RPC Control.....	88
Table 33 – RPC Read Implicit.....	89
Table 34 – RSI initiator add.....	93
Table 35 – RSI responder add.....	94
Table 36 – RSI initiator remove.....	95
Table 37 – RSI responder remove.....	96
Table 38 – RSI call.....	97
Table 39 – RSI notification.....	99
Table 40 – RSI initiator abort.....	100
Table 41 – RSI responder abort.....	101
Table 42 – RSI get responder instances.....	102
Table 43 – SNMP Enable SNMP v1/v2.....	105

Table 44 – SNMP Set Community Name	106
Table 45 – Add Static ARP Cache Entry	112
Table 46 – Remove Static ARP Cache Entry	113
Table 47 – PPM Set Prov Data	119
Table 48 – PPM Set Prov Status	120
Table 49 – PPM Activate	121
Table 50 – PPM Close	123
Table 51 – PPM Start	123
Table 52 – PPM Error	124
Table 53 – Get cons data	124
Table 54 – CPM Get cons status	125
Table 55 – CPM Set RedRole	126
Table 56 – CPM Activate	127
Table 57 – CPM NoData	129
Table 58 – CPM Stop	129
Table 59 – CPM New Data Indication	130
Table 60 – APMS Activate	132
Table 61 – APMR Activate	134
Table 62 – APMS A Data	136
Table 63 – APMR A Data	137
Table 64 – APMR Ack	137
Table 65 – APMS Error	138
Table 66 – APMS Error ERRCLS/ERRCODE	138
Table 67 – APMR Error	139
Table 68 – APMR Error ERRCLS/ERRCODE	139
Table 69 – APMS_Close	139
Table 70 – APMR_Close	140
Table 71 – Get	150
Table 72 – Set	155
Table 73 – Local Get Command	161
Table 74 – Local Set Command	162
Table 75 – Identity	163
Table 76 – Hello	170
Table 77 – PN DHCP Discover	174
Table 78 – PN DHCP Offer	175
Table 79 – System capabilities	181
Table 80 – Auto negotiation support and status	183
Table 81 – MDI Power Support	183
Table 82 – Remote systems data change	188
Table 83 – Start bridge	203
Table 84 – Start slave	204
Table 85 – Start master	205
Table 86 – Stop bridge	206

Table 87 – Stop slave	207
Table 88 – Stop master	208
Table 89 – Sync state change	208
Table 90 – Line Delay change	209
Table 91 – Local Get Time	213
Table 92 – Local time state info	213
Table 93 – Traffic classes	214
Table 94 – Port state change	221
Table 95 – Set port state	222
Table 96 – Flush filtering data base	222
Table 97 – Add FDB entry	223
Table 98 – Remove FDB entry	223
Table 99 – Config Port	224
Table 100 – Stream ID Add	232
Table 101 – Stream ID Remove	233
Table 102 – Stream Identification	234
Table 103 – Stream Active Identification	235
Table 104 – Stream Send	236
Table 105 – MAU Type change	240
Table 106 – Set MAU Type	241
Table 107 – P Data	242
Table 108 – N Data	243
Table 109 – A Data	245
Table 110 – C Data	246
Table 111 – R Data	247
Table 112 – Requirements and features	249
Table 113 – Internal components and ports in the interface mounted left or up into the rack	252
Table 114 – Internal components and ports mounted interface mounted right or down into the rack	252
Table 115 – Binding application relationship services	276
Table 116 – Device Access	279
Table 117 – Companion AR	280
Table 118 – Acknowledge Companion AR	280
Table 119 – Time Aware System	280
Table 120 – Startup Mode	281
Table 121 – Pull Module Alarm Allowed	281
Table 122 – Input Valid on Backup AR	284
Table 123 – Mode	285
Table 124 – APStructureIdentifier with API := 0	285
Table 125 – APStructureIdentifier with API != 0	286
Table 126 – RS Alarm Transport Mode	286
Table 127 – Connect	289
Table 128 – Connect Device Access	294

Table 129 – Release	296
Table 130 – Prm Begin	298
Table 131 – Prm End	299
Table 132 – Application Ready	301
Table 133 – Abort	302
Table 134 – Local AR Abort	302
Table 135 – Local Set AR State	303
Table 136 – Local AR In Data	303
Table 137 – Data elements of Read AR Data	304
Table 138 – Data elements of Expected Fast Startup Data	306
Table 139 – Remote primitives issued or received by DEVSM	307
Table 140 – Local primitives issued or received by DEVSM	307
Table 141 – State table DEVSM	309
Table 142 – Functions, Macros, Timers and Variables by DEVSM	314
Table 143 – Remote primitives issued or received by CTLISM	315
Table 144 – Local primitives issued or received by CTLISM	315
Table 145 – State table CTLISM	317
Table 146 – Functions, Macros, Timers and Variables used by CTLISM	319
Table 147 – Binding communication relationship services	325
Table 148 – Traffic Classes versus RT Class	327
Table 149 – Local Set Input	336
Table 150 – Local Set Input IOCS	337
Table 151 – Local Get Input	338
Table 152 – Local Get Input IOCS	339
Table 153 – Local New Input	340
Table 154 – Local Set Output	341
Table 155 – Local Set Output IOCS	342
Table 156 – Local Get Output	343
Table 157 – Local Get Output IOCS	344
Table 158 – Local New Output	345
Table 159 – Local Set Provider State	345
Table 160 – Local Set Redundancy	346
Table 161 – Local Set State	347
Table 162 – Local Data State Changed	347
Table 163 – Binding expected identification services	354
Table 164 – Module State	356
Table 165 – AR Info	360
Table 166 – Ident Info	360
Table 167 – General Data definition for identification services	361
Table 168 – Data elements of Read Module Diff Block	363
Table 169 – Alarm type	367
Table 170 – Alarm types attached to diagnosis ASE	369
Table 171 – Alarm types attached to ownership	370

Table 172 – Alarm types attached to common profiles, profiles, and application	370
Table 173 – Binding Alarm services	370
Table 174 – Alarm Notification	374
Table 175 – Channel Diagnosis	376
Table 176 – Manufacturer Specific Diagnosis.....	376
Table 177 – Submodule Diagnosis State.....	377
Table 178 – AR Diagnosis State	377
Table 179 – User Structure Identifier	378
Table 180 – Semantics of Specifier.....	380
Table 181 – Binding Record Data services.....	388
Table 182 – Read	389
Table 183 – Read Services	391
Table 184 – Read Implicit	394
Table 185 – Read Query	395
Table 186 – Read Query Services.....	396
Table 187 – Write	396
Table 188 – Write Services	397
Table 189 – Data elements of Write Combined Object Container	399
Table 190 – Local Write Multiple	400
Table 191 – Local New Write Multiple	402
Table 192 – Binding real identification services.....	409
Table 193 – Local Add Submodule.....	413
Table 194 – Local Remove Submodule	414
Table 195 – Data elements of Read API Data	415
Table 196 – Data elements of Read Record Input Data Object Element.....	416
Table 197 – Data elements of Read Record Output Data Object Element	419
Table 198 – Data elements of Read Substitute Value.....	420
Table 199 – Selector for Read GSD Data.....	422
Table 200 – Data elements of Read GSD Data	422
Table 201 – Remote primitives issued or received by RSMSM	424
Table 202 – Local primitives issued or received by RSMSM.....	424
Table 203 – State table RSMSM	425
Table 204 – Functions, Macros, Timers and Variables used by RSMSM	427
Table 205 – Rules for Submodule State.Ident Info	427
Table 206 – Remote primitives issued or received by OWNSM and ASSSM.....	430
Table 207 – Local primitives issued or received by OWNSM	430
Table 208 – State table OWNSM	432
Table 209 – State table ASSSM.....	438
Table 210 – Functions, Macros, Timers and Variables used by OWNSM.....	439
Table 211 – Functions, Macros, Timers and Variables used by ASSSM	440
Table 212 – Rules for Submodule State.AR Info	440
Table 213 – Remote primitives issued or received by PLUGSM	441
Table 214 – Local primitives issued or received by PLUGSM	442

Table 215 – State table PLUGSM	444
Table 216 – Functions, Macros, Timers and Variables used by PLUGSM.....	445
Table 217 – Remote primitives issued or received by PULLSM	446
Table 218 – Local primitives issued or received by PULLSM.....	446
Table 219 – State table PULLSM	447
Table 220 – Functions, Macros, Timers and Variables used by PULLSM	448
Table 221 – Binding I&M data services	450
Table 222 – Data elements of Read I&M0 Filter Data.....	464
Table 223 – Data elements of Read I&M0 Data.....	467
Table 224 – Data elements of Write I&M1 Data.....	468
Table 225 – Data elements of Write I&M2 Data.....	469
Table 226 – Data elements of Write I&M3 Data.....	469
Table 227 – Data elements of Write I&M4 Data.....	470
Table 228 – Data elements of Read I&M5 Data.....	471
Table 229 – Data elements of Read Asset Management Data	474
Table 230 – Binding Isochronous Mode Application services.....	478
Table 231 – Data elements of Write Isochronous Mode Data	483
Table 232 – Remote primitives issued or received by ISOM_SYNC.....	485
Table 233 – Local primitives issued or received by ISOM_SYNC	485
Table 234 – State table ISOM_SYNC.....	486
Table 235 – Functions, Macros, Timers and Variables used by the ISOM_SYNC	487
Table 236 – Remote primitives issued or received for ISOM_OUT	487
Table 237 – Local primitives issued or received for ISOM_OUT	488
Table 238 – State table ISOM_OUT	490
Table 239 – Functions, Macros, Timers and Variables used by the ISOM_OUT	492
Table 240 – Remote primitives issued or received for ISOM_IN	493
Table 241 – Local primitives issued or received for ISOM_IN.....	493
Table 242 – State table ISOM_IN.....	495
Table 243 – Functions, Macros, Timers and Variables used by the ISOM_IN	496
Table 244 – Observer service binding	498
Table 245 – Binding Communication Interface Management services	505
Table 246 – Subslot number for interface submodules	508
Table 247 – Subslot number for port submodules	511
Table 248 – Data elements of Read PDev Data	518
Table 249 – Data elements of Read PD Real Data.....	519
Table 250 – Data elements of Read PD Expected Data.....	520
Table 251 – Data elements of Read PD Interface Data Real	522
Table 252 – Data elements of Write PD Interface Adjust.....	523
Table 253 – Data elements of Write PD Interface FSU Data Adjust.....	523
Table 254 – Data elements of Write PD NC Data Check	524
Table 255 – Data elements of Read PD Port Statistic	525
Table 256 – Data elements of Read PD Port Data Real	526
Table 257 – Data elements of Read PD Port Data Real Extended.....	527

Table 258 – Data elements of Write PD Port Data Check.....	529
Table 259 – Data elements of Write PD Port Data Adjust.....	530
Table 260 – Data elements of Read Port FO Data Real	531
Table 261 – Data elements of Write PD Port FO Data Check	532
Table 262 – Data elements of Write PD Port FO Data Adjust	532
Table 263 – Data elements of Write PD Port SFP Data Check	533
Table 264 – Data elements of Read RSI Instances	534
Table 265 – Binding IEEE Std 802.1AS services.....	539
Table 266 – Binding IEEE Std 802.1Q bridge services	543
Table 267 – Allowed values of Forwarding Mode	550
Table 268 – Allowed values of Fast Forwarding Multicast MAC Add.....	550
Table 269 – Tx Port Entry	553
Table 270 – Dependencies of RedPeriodBegin and GreenPeriodBegin	556
Table 271 – Distributed Watchdog Factor	557
Table 272 – Restart Factor For Distributed Watchdog.....	558
Table 273 – DFP Mode	558
Table 274 – SFIOCRProperties.DFPRedundantPathLayout.....	559
Table 275 – SFCRC16	559
Table 276 – Data elements of Write PD IR Data	570
Table 277 – Data elements of Write PD IR Subframe Data.....	572
Table 278 – Write CIM NetConf Stream Forward Data	575
Table 279 – Binding Media Redundancy services	577
Table 280 – Data elements of Read PD Interface MRP Data Real.....	579
Table 281 – Data elements of Write PD Interface MRP Data Check	581
Table 282 – Data elements of Write PD Interface MRP Data Adjust.....	582
Table 283 – Data elements of Read PD Port MRP Data Real.....	583
Table 284 – Data elements of Write PD Port MRP Data Adjust	584
Table 285 – Data elements of Read PD Port MRPIC Data Real	585
Table 286 – Data elements of Write PD Port MRPIC Data Check.....	585
Table 287 – Data elements of Write PD Port MRPIC Data Adjust.....	586
Table 288 – Binding PTCP services	590
Table 289 – Sync Properties Role.....	593
Table 290 – Sync Class	593
Table 291 – Data elements of Write PD Sync Data	594
Table 292 – Local Sync State Info	596
Table 293 – Local SYNCH Event	597
Table 294 – Remote primitives issued or received by SYNC_DIAG	598
Table 295 – Local primitives issued or received by SYNC_DIAG.....	598
Table 296 – State table SYNC_DIAG	599
Table 297 – Functions, Macros, Timers and Variables used by SYNC_DIAG	601
Table 298 – List of supported MIBs.....	601
Table 299 – Cross-referencing of MIB-II objects	602
Table 300 – Cross-referencing of LLDP-MIB objects	602

Table 301 – Cross-referencing of LLDP-EXT-PNO MIB objects	603
Table 302 – Cross-referencing of LLDP-EXT-DOT3 MIB objects	603
Table 303 – IEEE Std 802.1Q ASE related YANG modules (type definitions)	604
Table 304 – Diagnosis Records (index).....	612
Table 305 – Binding Diagnosis services.....	613
Table 306 – General Data definition for Diagnosis services.....	618
Table 307 – Local Add Diagnosis Entry.....	620
Table 308 – Local Remove Diagnosis Entry	622
Table 309 – Local Update Diagnosis Entry.....	623
Table 310 – Remote primitives issued or received by DIAG_DIAG	637
Table 311 – Local primitives issued or received by DIAG_DIAG	637
Table 312 – State table DIAG_DIAG	638
Table 313 – Functions, Macros, Timers and Variables used by DIAG_DIAG	639
Table 314 – Remote primitives issued or received by DIAG_MR	641
Table 315 – Local primitives issued or received by DIAG_MR.....	641
Table 316 – State table DIAG_MR	642
Table 317 – Functions, Macros, Timers and Variables used by DIAG_MR.....	643
Table 318 – Remote primitives issued or received by DIAG_MD	644
Table 319 – Local primitives issued or received by DIAG_MD	644
Table 320 – State table DIAG_MD	646
Table 321 – Functions, Macros, Timers and Variables used by the maintenance demanded entry	647
Table 322 – Remote primitives issued or received by DIAG_QUALIFIED	648
Table 323 – Local primitives issued or received by DIAG_QUALIFIED	649
Table 324 – State table DIAG_QUALIFIED	650
Table 325 – Functions, Macros, Timers and Variables used by DIAG_QUALIFIED	650
Table 326 – Binding PE services.....	654
Table 327 – Local Add PE Entity.....	655
Table 328 – Local Remove PE Entity	656
Table 329 – Local Update PE_OperationalMode	657
Table 330 – PE Entity Filter Data definition.....	658
Table 331 – PE Entity Filter Data definition.....	659
Table 332 – Remote primitives issued or received by PESM	660
Table 333 – Local primitives issued or received by PESM.....	661
Table 334 – State table PESM	662
Table 335 – Functions, Macros, Timers and Variables used by PESM	662
Table 336 – Binding LogBook services	663
Table 337 – Data elements of Read LogBook Data	664
Table 338 – Local Create LogBook Entry	665
Table 339 – Binding RS services	672
Table 340 – Immanent observers	674
Table 341 – Configured observers	674
Table 342 – Data elements of Local Add RS Event	680

Table 343 – Data elements of RS Get Event	680
Table 344 – Data elements of RS Ack Event.....	681
Table 345 – Data elements of RS Adjust Observer	682
Table 346 – Local primitives issued or received by RSOBS	683
Table 347 – State table RSOBS.....	685
Table 348 – Functions, Macros, Timers and Variables used by RSOBS	686
Table 349 – Remote primitives issued or received by RSBUF	686
Table 350 – Local primitives issued or received by RSBUF.....	687
Table 351 – State table RSBUF	688
Table 352 – Functions, Macros, Timers and Variables used by RSBUF.....	690
Table 353 – Binding Time services	691
Table 354 – Local Get Time	691
Table 355 – Local primitives issued or received by TimeSM.....	692
Table 356 – State table TimeSM	694
Table 357 – Functions, Macros, Timers and Variables used by TimeSM	694
Table 358 – NME Start	701
Table 359 – NME Stop.....	702
Table 360 – NME Stream Add.....	703
Table 361 – NME Stream Remove	707
Table 362 – NME Stream Renew	709
Table 363 – NCE Activate.....	712
Table 364 – NCE Deactivate.....	712
Table 365 – NCE NetworkConfig Changed.....	713
Table 366 – TDE Activate	715
Table 367 – TDE Close.....	716
Table 368 – TDE Topology Changed	716
Table 369 – PCE Activate	718
Table 370 – PCE Deactivate	719
Table 371 – PCE Stream Add	720
Table 372 – PCE Stream Remove.....	721
Table 373 – PCE Stream Renew.....	722
Table 374 – PCE Path Changed	723
Table 375 – BNME Activate	725
Table 376 – BNME Close.....	726
Table 377 – BNME Role Changed.....	726
Table 378 – NUE Activate.....	729
Table 379 – NUE Deactivate.....	729
Table 380 – NUE Stream Add	731
Table 381 – NUE Stream Remove	732
Table 382 – NUE Stream Renew.....	733
Table 383 – FAL services of the IO device.....	736
Table 384 – FAL services of the IO controller	737
Table F.1 – ChannelErrorType	755

Table F.2 – Preconditions ChannelErrorType 0 – 0xFF	756
Table F.3 – Preconditions for ChannelErrorType 0x0100 – 0x7FFF, 0x9000 – 0x9FFF	756
Table F.4 – Preconditions for ChannelErrorType “Data transmission impossible”	756
Table F.5 – Preconditions for ChannelErrorType “Remote mismatch”	757
Table F.6 – Preconditions for ChannelErrorType “Media redundancy mismatch – ring”	757
Table F.7 – Preconditions for ChannelErrorType “Media redundancy mismatch – interconnection”	758
Table F.8 – Preconditions for ChannelErrorType “Sync mismatch”	758
Table F.9 – Preconditions for ChannelErrorType “Isochronous mode mismatch”	758
Table F.10 – Preconditions for ChannelErrorType “Multicast CR mismatch”	758
Table F.11 – Preconditions for ChannelErrorType “Fiber optic mismatch”	759
Table F.12 – Preconditions for ChannelErrorType “Network component function mismatch”	759
Table F.13 – Preconditions for ChannelErrorType “Dynamic Frame Packing function mismatch”	759
Table F.14 – Preconditions for ChannelErrorType “Media redundancy with planned duplication mismatch”	759
Table F.15 – Preconditions for ChannelErrorType “Multiple interface mismatch”	760
Table F.16 – Preconditions for ChannelErrorType “Power failure over Single Pair Ethernet”	760

INTERNATIONAL ELECTROTECHNICAL COMMISSION

**INDUSTRIAL COMMUNICATION NETWORKS –
FIELDBUS SPECIFICATIONS –****Part 5-10: Application layer service definition –
Type 10 elements**

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IEC 61158-5-10 has been prepared by subcommittee 65C: Industrial networks, of IEC technical committee 65: Industrial-process measurement, control and automation. It is an International Standard.

This fifth edition cancels and replaces the fourth edition published in 2019. This edition constitutes a technical revision.

This edition includes the following significant technical changes with respect to the previous edition:

- a) integration of system redundancy basic functionality;
- b) integration of dynamic reconfiguration basic functionality;
- c) integration of reporting system basic functionality;
- d) integration of asset management basic functionality;

e) integration of media redundancy ring interconnection basic functionality.

The text of this International Standard is based on the following documents:

Draft	Report on voting
65C/1203/FDIS	65C/1244/RVD

Full information on the voting for its approval can be found in the report on voting indicated in the above table.

The language used for the development of this International Standard is English.

This document was drafted in accordance with ISO/IEC Directives, Part 2, and developed in accordance with ISO/IEC Directives, Part 1 and ISO/IEC Directives, IEC Supplement, available at www.iec.ch/members_experts/refdocs. The main document types developed by IEC are described in greater detail at www.iec.ch/publications.

A list of all parts of the IEC 61158 series, published under the general title *Industrial communication networks – Fieldbus specifications*, can be found on the IEC web site.

The committee has decided that the contents of this document will remain unchanged until the stability date indicated on the IEC website under webstore.iec.ch in the data related to the specific document. At this date, the document will be

- reconfirmed,
- withdrawn,
- replaced by a revised edition, or
- amended.

IMPORTANT – The "colour inside" logo on the cover page of this document indicates that it contains colours which are considered to be useful for the correct understanding of its contents. Users should therefore print this document using a colour printer.

INTRODUCTION

This part of IEC 61158 is one of a series produced to facilitate the interconnection of automation system components. It is related to other standards in the set as defined by the “three-layer” fieldbus reference model described in IEC 61158-1.

The application service is provided by the application protocol making use of the services available from the data-link or other immediately lower layer. This document defines the application service characteristics that fieldbus applications and/or system management can exploit.

Throughout the set of fieldbus standards, the term “service” refers to the abstract capability provided by one layer of the OSI Basic Reference Model to the layer immediately above. Thus, the application layer service defined in this document is a conceptual architectural service, independent of administrative and implementation divisions.

INDUSTRIAL COMMUNICATION NETWORKS – FIELDBUS SPECIFICATIONS –

Part 5-10: Application layer service definition – Type 10 elements

1 Scope

1.1 General

The fieldbus application layer (FAL) provides user programs with a means to access the fieldbus communication environment. In this respect, the FAL can be viewed as a “window between corresponding application programs”.

This part of IEC 61158 provides common elements for basic time-critical and non-time-critical messaging communications between application programs in an automation environment and material specific to Type 10 fieldbus. The term "time-critical" is used to represent the presence of a time-window, within which one or more specified actions are required to be completed with some defined level of certainty. Failure to complete specified actions within the time window risks failure of the applications requesting the actions, with attendant risk to equipment, plant and possibly human life.

This document defines in an abstract way the externally visible service provided by the Type 10 fieldbus application layer in terms of:

- an abstract model for defining application resources (objects) capable of being manipulated by users via the use of the FAL service,
- the primitive actions and events of the service;
- the parameters associated with each primitive action and event, and the form which they take; and
- the interrelationship between these actions and events, and their valid sequences.

The purpose of this document is to define the services provided to:

- the FAL user at the boundary between the user and the application layer of the fieldbus reference model, and
- Systems Management at the boundary between the application layer and Systems Management of the fieldbus reference model.

This document specifies the structure and services of the Type 10 fieldbus application layer, in conformance with the OSI Basic Reference Model (ISO/IEC 7498-1) and the OSI application layer structure (ISO/IEC 9545).

FAL services and protocols are provided by FAL application-entities (AE) contained within the application processes. The FAL AE is composed of a set of object-oriented application service elements (ASEs) and a layer management entity (LME) that manages the AE. The ASEs provide communication services that operate on a set of related application process object (APO) classes. One of the FAL ASEs is a management ASE that provides a common set of services for the management of the instances of FAL classes.