



SLOVENSKI STANDARD
oSIST prEN IEC 61375-2-6:2024
01-september-2024

**Železniške elektronske naprave - Komunikacijsko omrežje vlaka - 2-6. del:
Komunikacija vlak-tla**

Electronic railway equipment - Train communication network (TCN) - Part 2-6: On-board to ground communication

Elektronische Betriebsmittel für Bahnen - Zug-Kommunikations-Netzwerk (TCN) - Teil 2-6: Kommunikation vom Zug zur Landseite

Matériel électronique ferroviaire - Réseau embarqué de train (TCN) - Partie 2-6: Communication train-sol

Ta slovenski standard je istoveten z: prEN IEC 61375-2-6:2024

[oSIST prEN IEC 61375-2-6:2024](https://standards.sist.si/standards/standard/osist-prEN-IEC-61375-2-6-2024)

ICS:

35.240.60	Uporabniške rešitve IT v prometu	IT applications in transport
45.060.01	Železniška vozila na splošno	Railway rolling stock in general

oSIST prEN IEC 61375-2-6:2024 **en**



9/3082/CDV

COMMITTEE DRAFT FOR VOTE (CDV)

PROJECT NUMBER: IEC 61375-2-6 ED2	
DATE OF CIRCULATION: 2024-06-28	CLOSING DATE FOR VOTING: 2024-09-20
SUPERSEDES DOCUMENTS: 9/2838/CD, 9/2876/CC	

IEC TC 9 : ELECTRICAL EQUIPMENT AND SYSTEMS FOR RAILWAYS	
SECRETARIAT: France	SECRETARY: Mr Denis MIGLIANICO
OF INTEREST TO THE FOLLOWING COMMITTEES:	PROPOSED HORIZONTAL STANDARD: <input type="checkbox"/> Other TC/SCs are requested to indicate their interest, if any, in this CDV to the secretary.
FUNCTIONS CONCERNED: <input type="checkbox"/> EMC <input type="checkbox"/> ENVIRONMENT <input type="checkbox"/> QUALITY ASSURANCE <input type="checkbox"/> SAFETY	
<input checked="" type="checkbox"/> SUBMITTED FOR CENELEC PARALLEL VOTING Attention IEC-CENELEC parallel voting The attention of IEC National Committees, members of CENELEC, is drawn to the fact that this Committee Draft for Vote (CDV) is submitted for parallel voting. The CENELEC members are invited to vote through the CENELEC online voting system.	<input type="checkbox"/> NOT SUBMITTED FOR CENELEC PARALLEL VOTING

oSIST prEN IEC 61375-2-6:2024

<https://standards.iteh.ai/catalog/standards/sist/61375-2-6-2024/iec-61375-2-6-2024>

This document is still under study and subject to change. It should not be used for reference purposes.

Recipients of this document are invited to submit, with their comments, notification of any relevant patent rights of which they are aware and to provide supporting documentation.

Recipients of this document are invited to submit, with their comments, notification of any relevant "In Some Countries" clauses to be included should this proposal proceed. Recipients are reminded that the CDV stage is the final stage for submitting ISC clauses. (SEE AC/22/2007 OR NEW GUIDANCE DOC).

TITLE:

Electronic railway equipment - Train communication network (TCN) - Part 2-6: On-board to ground communication

PROPOSED STABILITY DATE: 2030

NOTE FROM TC/SC OFFICERS:

Copyright © 2024 International Electrotechnical Commission, IEC. All rights reserved. It is permitted to download this electronic file, to make a copy and to print out the content for the sole purpose of preparing National Committee positions. You may not copy or "mirror" the file or printed version of the document, or any part of it, for any other purpose without permission in writing from IEC.

CONTENTS

1			
2	FOREWORD.....		9
3	INTRODUCTION.....		11
4	1 Scope.....		12
5	2 Normative references		13
6	3 Terms, definitions, symbols, abbreviated terms and conventions		13
7	3.1 Terms and definitions.....		13
8	3.2 Symbols and abbreviated terms		19
9	3.3 State diagram conventions.....		22
10	4 Train to Ground Communication system architecture.....		23
11	4.1 General.....		23
12	4.2 Requirements		24
13	4.3 Mobile communication network architecture		26
14	4.4 System breakdown.....		28
15	4.5 Functional breakdown		28
16	4.5.1 General		28
17	4.5.2 Data transfer from train to ground.....		28
18	4.5.3 Data transfer from ground to train.....		29
19	4.5.4 Connection Management between train and ground.....		31
20	4.5.5 Addressing functions on a train from groundside applications		32
21	4.5.6 Addressing groundside applications/functions from a train.....		33
22	4.6 Mobile Communication Gateway		34
23	4.6.1 Architecture.....		34
24	4.6.2 Mobile communication gateway		36
25	4.7 Addressing concept		37
26	4.7.1 Use cases.....		37
27	4.7.2 Consist and train Identification.....		37
28	4.7.3 T2G Network Borders		40
29	4.7.4 T2G minimum network.....		40
30	4.7.5 T2G addressing.....		41
31	4.7.6 HTTP-URI.....		43
32	4.8 Mobile communication redundancy		44
33	4.8.1 General		44
34	4.8.2 Full performance redundancy		45
35	4.8.3 Reduced performance redundancy		46
36	4.9 Cybersecurity.....		46
37	4.9.1 Zones and conduits		46
38	4.9.2 Security measures		46
39	4.9.3 Authentication authorization accounting model		47
40	4.9.4 Network and MCG classification		48
41	5 Communication framework		50
42	5.1 General.....		50
43	5.2 MCG broker service architecture.....		51
44	5.3 Train composition operational changes (Option)		51
45	5.4 Data classes for T2G communication		52
46	5.4.1 General		52
47	5.4.2 Communication channel establishment.....		53
48	5.4.3 Message data.....		53
49	5.4.4 Process data		53

50	5.4.5	Stream Data	54
51	5.4.6	Bulk data	54
52	5.5	Communication protocol.....	54
53	5.5.1	General	54
54	5.5.2	HTTP(S) - HTTP running over TLS	56
55	5.5.3	MQTT (Telemetry / Process Data Option)	58
56	5.5.4	RTP (Streaming Option)	58
57	5.6	Communication services	59
58	5.6.1	General	59
59	5.6.2	Message data communication service.....	60
60	5.6.3	File transfer communication service.....	66
61	5.6.4	Process Data Service (Binary Format for Telemetry)	89
62	5.6.5	Process Data Service (IoT Telemetry)	93
63	5.6.6	Stream Data Service.....	103
64	6	Services and interfaces (MCG)	105
65	6.1	Overview.....	105
66	6.1.1	MCG system service architecture	105
67	6.1.2	MCG / GCG system service interfaces.....	106
68	6.1.3	MCG / GCG communication relationship.....	106
69	6.2	MCG / GCG system service description	107
70	6.2.1	Communication Services	107
71	6.2.2	Capability detection	108
72	6.2.3	Train Location Service (Option)	116
73	6.2.4	Train Information Service.....	120
74	6.2.5	MCG Network Selector Service.....	125
75	6.2.6	Train telemetry service (Option).....	127
76	6.2.7	MCG Train Wake-up Service (Option).....	137
77	6.2.8	MCG Poll Command Set Service (Option).....	144
78	7	Services and interfaces (GCG)	151
79	7.1	GCG Overview	151
80	7.2	GCG Addressing.....	153
81	7.2.1	Wireless MCG Interface.....	153
82	7.2.2	Ground GCG Interface.....	153
83	7.3	GCG Implementation	153
84	7.3.1	General (informative).....	153
85	7.3.2	GCG Availability	154
86	7.3.3	GCG Workload	154
87	7.3.4	GCG Security	154
88	7.4	GCG services	154
89	7.4.1	GCG services protocol.....	154
90	7.4.2	GCG Fleet Database	154
91	7.4.3	MCG-GCG services	154
92	7.4.4	File transfer communication service.....	155
93	7.4.5	Local Ground GCG Interface.....	155
94	7.4.6	Home GCG – Foreign GCG services.....	156
95	7.4.7	Public Ground GCG services	156
96	Annex A (normative)	JSON Message presentation	158
97	A.1	General.....	158
98	A.2	Transmission rules.....	158
99	A.3	Generic message	158

100	Annex B (Informative) Changelog for IEC 61375-2-6.....	159
101	B.1 Purpose	159
102	B.2 General Changes	159
103	B.2.1 Addressing concept	159
104	B.2.2 Cybersecurity	159
105	B.2.3 DNS Usage.....	159
106	B.2.4 ComID Harmonization.....	159
107	B.2.5 Communication Service	163
108	B.3 Changes to Train-to-Ground (T2G) Services	163
109	B.3.1 Changes for the Capability Exchange (CAP)	163
110	B.3.2 Changes for the Network Selector Service (NSS)	163
111	B.3.3 Changes for the File Transfer Service (FTS).....	163
112	B.3.4 Changes to the Train Location Service (TLOS)	163
113	B.3.5 Changes to the Train Telemetry Service (TTS)	163
114	Bibliography.....	164
115		
116	Figure 1 Train to Ground Communication System	27
117	Figure 2 Train on-board communication system (example).....	27
118	Figure 3 Option 1: End device board to ground communication via MCG.....	35
119	Figure 4 Option 2: End Device board to ground communication	35
120	Figure 5 – MCG abstract model block diagram.....	36
121	Figure 6 – MCG configured as ALG	37
122	Figure 8 – Operational environments	39
123	Figure 9 – Minimum Train to Ground Network Setup.....	40
124	Figure 10 – A train consisting of four vehicles.....	41
125	Figure 11 – Procedure to update the ground DNS server	43
126	Figure 12 – Example of an on-board architecture able to provide mobile communication	
127	redundancy.....	45
128	Figure 13 – MCG connecting open and closed transmission systems.....	50
129	Figure 14 MCG broker service architecture	51
130	Figure 15 – Communication stacks	56
131	Figure 16 – HTTP(S) MD communication pattern	57
132	Figure 17 – HTTP(S) request/event.....	57
133	Figure 18 – HTTP(S) response	57
134	Figure 19 - Message Data exchange (example)	61
135	Figure 20 – Message Data telegram structure.....	62
136	Figure 21 – File upload example	68
137	Figure 22 – File download example.....	79
138	Figure 24 – Example of ordering criteria	92
139	Figure 25 – Example of values grouping	92
140	Figure 29 – VSS control flow.....	104
141	Figure 31 – Service interfaces	106
142	Figure 32 – Procedure to establish the radio link from MCG.....	107
143	Figure 33 – Procedure to establish the radio link from GCG	108
144	Figure 35 – Example architecture to provide the train location	116
145	Figure 36 – Example procedure to notify about current train location	117

146	Figure 37 – Example architecture to notify about train information	121
147	Figure 38 – Example procedure to notify about train information	122
148	Figure 39 – Illustration of network selector.....	126
149	Figure 40 – Architecture to provide telemetry data	127
150	Figure 41 – Procedure to notify about current train location	128
151	Figure 44 – MCG Poll Command Set Service	145
152	Figure 45 – Train to Ground interfaces.....	152
153		
154	Table 1 - Train to ground requirement.....	24
155	Table 2 – Train to ground system breakdown.....	28
156	Table 3 – Function Breakdown: Data Transfer Train to Ground	29
157	Table 4 – Function Breakdown: Data Transfer Ground to Train	30
158	Table 5 – Function Breakdown: Connection Management between train and ground.....	31
159	Table 6 – Function Breakdown: Addressing functions on a train from groundside	
160	applications	32
161	Table 7 – Function Breakdown: Addressing groundside applications/functions from a	
162	train 33	
163	Table 8 - Type of identification.....	38
164	Table 9 - TCN-URI global DNS zone	43
165	Table 11 – MCG categories	49
166	Table 12 – Security requirements for Category 1 MCGs.....	49
167	Table 14 – Recommended service parameters for message data.....	53
168	Table 15 – Recommended service parameters for process data.....	54
169	Table 16 – Recommended service parameters for stream data	54
170	Table 17 – Recommended service parameters for bulk data	54
171	Table 19 – HTTP(S) parameters request/response pattern.....	57
172	Table 21 – General MD Header.....	63
173	Table 22 – General MD body	64
174	Table 23 ComID grouping per service	65
175	Table 24 – Message types	66
176	Table 25 – Message representation	66
177	Table 26 – File transfer terminology.....	66
178	Table 27 – ComID 1101: MD header telegram values	69
179	Table 28 – ComID 1101: MD body telegram values.....	69
180	Table 29 – ComID 1101: MD body: mdPayload object.....	70
181	Table 30 – ComID 1102: MD header telegram values	70
182	Table 31 – ComID 1102: MD body telegram values.....	70
183	Table 32 – ComID 1102: MD body: mdPayload object.....	71
184	Table 33 – ComID 1103: MD header telegram values	71
185	Table 34 – ComID 1103: MD body telegram values.....	71
186	Table 35 – ComID 1103: MD body: mdPayload object.....	71
187	Table 36 – ComID 1104: MD header telegram values	72
188	Table 37 – ComID 1104: MD body telegram values.....	72
189	Table 38 – ComID 1104: MD body: mdPayload object.....	72
190	Table 40 – ComID 1105: MD header telegram values	73

191	Table 41 – ComID 1105: MD body telegram values	73
192	Table 42 – ComID 1105: MD body: mdPayload object	74
193	Table 43 – ComID 1106: MD header telegram values	74
194	Table 44 – ComID 1106: MD body telegram values	75
195	Table 45 – ComID 1106: MD body: mdPayload object	75
196	Table 46 – ComID XXX: MD header telegram values	76
197	Table 47 – ComID XXX: MD body telegram values	76
198	Table 48 – ComID XXX: MD body: mdPayload object	76
199	Table 49 – ComID ZZZ: MD header telegram values	77
200	Table 50 – ComID ZZZ: MD body telegram values	77
201	Table 51 – ComID ZZZ: MD Payload object	77
202	Table 52 – Specification of one element of the list of ComID ZZZ	78
203	Table 53 – ComID 1107: MD header telegram values	80
204	Table 54 – ComID 1107: MD body telegram values	81
205	Table 55 – ComID 1107: MD body: mdPayload object	81
206	Table 56 – ComID 1108: MD header telegram values	82
207	Table 57 – ComID 1108: MD body telegram values	82
208	Table 58 – ComID 1108: MD body: mdPayload object	82
209	Table 59 – ComID 1117: MD header telegram values	83
210	Table 60 – ComID 1109: MD header telegram values	83
211	Table 61 – ComID 1109: MD body telegram values	83
212	Table 62 – ComID 1109: MD body: mdPayload object	84
213	Table 63 – ComID 1110: MD header telegram values	84
214	Table 64 – ComID 1110: MD body telegram values	84
215	Table 65 – ComID 1110: MD body: mdPayload object	84
216	Table 66 – ComID 1119: MD header telegram values	85
217	Table 67 – ComID 1111: MD header telegram values	86
218	Table 68 – ComID 1111: MD body telegram values	86
219	Table 69 – ComID 1111: MD body: mdPayload object	86
220	Table 70 – ComID 1112: MD header telegram values	87
221	Table 71 – ComID 1112: MD body telegram values	87
222	Table 72 – ComID 1112: MD body: mdPayload object	87
223	Table 73 – ComID 1113: MD header telegram values	87
224	Table 74 – ComID 1113: MD body telegram values	88
225	Table 75 – ComID 1113: MD body: mdPayload object	88
226	Table 76 – ComID 1114: MD header telegram values	88
227	Table 77 – ComID 1114: MD body telegram values	89
228	Table 78 – ComID 1114: MD body: mdPayload object	89
229	Table 79 – Example of values decoding	93
230	Table 80 – MQTT topic syntax	94
231	Table 81 – Examples for MQTT topic names	94
232	Table 82 – key topic elements	96
233	Table 83 – Mandatory/Optional JSON-object attributes for entries of variables-array	96
234	Table 84 – Basic data type definition extended by type OBJECT	97

235	Table 85 – topicsAvailable array element	101
236	Table 86 – topicsAvailable entry payload elements.....	101
237	Table 88 – topicsRequested entry payload elements.....	102
238	Table 89 – ComID 1001: Capability message.....	110
239	Table 90 – ComID 1001: MD event body: mdPayload object	110
240	Table 91 – ComID 1002: Capability message.....	111
241	Table 92 – ComID 1002: MD event body telegram values	111
242	Table 95 - serviceList array entry: key/value pairs	114
243	Table 96 - supportedCapabilities array entry: key/value pairs	114
244	Table 97 - supportedCapabilities array: valid values	115
245	Table 98 - streamSources array entry: key/value pairs.....	116
246	Table 99 – ComID 1201: MD request header telegram values	118
247	Table 100 – ComID 1201: MD request body telegram values	118
248	Table 101 – ComID 1201: MD request body: mdPayload object	118
249	Table 102 – ComID 1202: MD reply header telegram values	119
250	Table 103 – ComID 1202: MD reply body telegram values	119
251	Table 104 – ComID 1202 /1203: MD reply/notification body: mdPayload object.....	119
252	Table 105 – ComID 1203: MD header telegram values.....	120
253	Table 106 – ComID 1203: MD body telegram values.....	120
254	Table 107 – ComID 1301: MD request header telegram values	123
255	Table 108 – ComID 1301: MD request body telegram values	123
256	Table 109 – ComID 1301: MD request body: mdPayload object	123
257	Table 110 – ComID 1302: MD reply header telegram values	123
258	Table 111 – ComID 1302: MD reply body telegram values	124
259	Table 112 – ComID 1302: MD reply body: mdPayload object	124
260	Table 113 – ComID 1303: MD header telegram values.....	125
261	Table 114 – ComID 1303: MD body telegram values.....	125
262	Table 115 – ComID 240: MD request header telegram values	129
263	Table 116 – ComID 240: MD request Body telegram values	129
264	Table 117 – ComID 240: MD reply header telegram values	129
265	Table 118 – ComID 240: MD reply body telegram values	130
266	Table 119 – ComID 240: MD reply body: mdPayload object	130
267	Table 120 – ComID 242: MD request header telegram values	131
268	Table 121 – ComID 242: MD request Body telegram values	131
269	Table 122 – ComID 242: MD request body: mdPayload object	132
270	Table 123 – ComID 242: MD reply header telegram values	132
271	Table 124 – ComID 242: MD reply body telegram values	133
272	Table 125 – ComID 242: MD reply body: mdPayload object	133
273	Table 126 – ComID 243: MD request header telegram values	134
274	Table 127 – ComID 243: MD request Body telegram values	134
275	Table 128 – ComID 243: MD request body: mdPayload object	134
276	Table 129 – ComID 244: MD request header telegram values	135
277	Table 130 – ComID 244: MD request Body telegram values	135
278	Table 131 – ComID 244: MD request body: mdPayload object	135

279	Table 132 – ComID 244: MD reply header telegram values	135
280	Table 133 – ComID 244: MD reply body telegram values	136
281	Table 134 – ComID 244: MD reply body: mdPayload object	136
282	Table 135 – ComID 245: MD request header telegram values	136
283	Table 136 – ComID 245: MD request Body telegram values	136
284	Table 137 – ComID 245: MD request body: mdPayload object	137
285	Table 138 - ComID 1501: twsWakeUp MD event header	139
286	Table 139 - ComID 1501: twsWakeUp MD event body	139
287	Table 140 – ComID 1502: twsWakeUp MD response header.....	139
288	Table 141 – ComID 1502: twsWakeUp MD response body	140
289	Table 142 – ComID 1502: twsWakeUp MD response body – mdPayload object	140
290	Table 143 – ComID 1505: twsWakeUp MD notification header	140
291	Table 144 – ComID 1503: twsStatus MDRequest header	142
292	Table 145 – ComID 1503: twsStatus MDRequest body.....	142
293	Table 146 – ComID 1504: twsStatus MDResponse header.....	143
294	Table 147 – ComID 1504: twsStatus MDResponse body.....	144
295	Table 148 – MCG Poll Command Set Service: mdCommandSet.....	144
296	Table 149 – ComID 1601 pcsCommandSetRequest: MD request header	146
297	Table 150 – ComID pcsCommandSetRequest: MD request body	146
298	Table 151 – ComID 1602 pcsCommandSetResponse: MD request header.....	146
299	Table 152 – ComID 1602 pcsCommandSetResponse: MD response body	146
300	Table 153 – List of ComIDs from IEC 61375-2-6:2018.....	160
301	Table 154 – List of harmonized ComIDs for the next IEC 61375-2-6 revision	162

302

303

Document Preview

[oSIST prEN IEC 61375-2-6:2024](https://standards.iteh.ai/catalog/standards/sist/4a97f731-7224-4017-80a0-662a947e10ab/osist-pren-iec-61375-2-6-2024)

<https://standards.iteh.ai/catalog/standards/sist/4a97f731-7224-4017-80a0-662a947e10ab/osist-pren-iec-61375-2-6-2024>

304

INTERNATIONAL ELECTROTECHNICAL COMMISSION

305

306

307

**ELECTRONIC RAILWAY EQUIPMENT –
TRAIN COMMUNICATION NETWORK (TCN) –**

308

309

Part 2-6: On-board to ground communication

310

311

312

FOREWORD

313 1) The International Electrotechnical Commission (IEC) is a worldwide organization for standardization comprising
314 all national electrotechnical committees (IEC National Committees). The object of IEC is to promote
315 international co-operation on all questions concerning standardization in the electrical and electronic fields. To
316 this end and in addition to other activities, IEC publishes International Standards, Technical Specifications,
317 Technical Reports, Publicly Available Specifications (PAS) and Guides (hereafter referred to as “IEC
318 Publication(s)”). Their preparation is entrusted to technical committees; any IEC National Committee interested
319 in the subject dealt with may participate in this preparatory work. International, governmental and non-
320 governmental organizations liaising with the IEC also participate in this preparation. IEC collaborates closely
321 with the International Organization for Standardization (ISO) in accordance with conditions determined by
322 agreement between the two organizations.

323 2) The formal decisions or agreements of IEC on technical matters express, as nearly as possible, an international
324 consensus of opinion on the relevant subjects since each technical committee has representation from all
325 interested IEC National Committees.

326 3) IEC Publications have the form of recommendations for international use and are accepted by IEC National
327 Committees in that sense. While all reasonable efforts are made to ensure that the technical content of IEC
328 Publications is accurate, IEC cannot be held responsible for the way in which they are used or for any
329 misinterpretation by any end user.

330 4) In order to promote international uniformity, IEC National Committees undertake to apply IEC Publications
331 transparently to the maximum extent possible in their national and regional publications. Any divergence
332 between any IEC Publication and the corresponding national or regional publication shall be clearly indicated in
333 the latter.

334 5) IEC itself does not provide any attestation of conformity. Independent certification bodies provide conformity
335 assessment services and, in some areas, access to IEC marks of conformity. IEC is not responsible for any
336 services carried out by independent certification bodies.

337 6) All users should ensure that they have the latest edition of this publication.

338 7) No liability shall attach to IEC or its directors, employees, servants or agents including individual experts and
339 members of its technical committees and IEC National Committees for any personal injury, property damage or
340 other damage of any nature whatsoever, whether direct or indirect, or for costs (including legal fees) and
341 expenses arising out of the publication, use of, or reliance upon, this IEC Publication or any other IEC
342 Publications.

343 8) Attention is drawn to the Normative references cited in this publication. Use of the referenced publications is
344 indispensable for the correct application of this publication.

345 9) Attention is drawn to the possibility that some of the elements of this IEC Publication may be the subject of
346 patent rights. IEC shall not be held responsible for identifying any or all such patent rights.

347 International Standard IEC 61375-2-6 has been prepared by IEC technical committee 9:
348 Electrical equipment and systems for railways.

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

FDIS	Report on voting
9/2374/FDIS	9/2402/RVD

350

351 Full information on the voting for the approval of this International Standard can be found in the
352 report on voting indicated in the above table.

353 This document has been drafted in accordance with the ISO/IEC Directives, Part 2.

354 A list of all parts in the IEC 61375 series, published under the general title *Electronic railway
355 equipment – Train communication network (TCN)*, can be found on the IEC website.

356 The committee has decided that the contents of this document will remain unchanged until the
357 stability date indicated on the IEC website under "<http://webstore.iec.ch>" in the data related to
358 the specific document. At this date, the document will be

- 359 • reconfirmed,
- 360 • withdrawn,
- 361 • replaced by a revised edition, or
- 362 • amended.

363

IMPORTANT – The 'colour inside' logo on the cover page of this publication 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.

364

365

iTeh Standards (<https://standards.iteh.ai>) Document Preview

[oSIST prEN IEC 61375-2-6:2024](https://standards.iteh.ai/catalog/standards/sist/4a97f731-7224-4017-80a0-662a947e10ab/osist-pren-iec-61375-2-6-2024)

<https://standards.iteh.ai/catalog/standards/sist/4a97f731-7224-4017-80a0-662a947e10ab/osist-pren-iec-61375-2-6-2024>

366

INTRODUCTION

367 Considering that the TCN series includes IEC 61375-2-3: *Electronic railway equipment – Train*
368 *communication network (TCN) – Part 2-3: TCN communication profile*, references to this
369 document are given when the case applies.

370 This document follows the ISO-OSI model.

371 This document does not define the specification of any broadband cellular network technology
372 or wireless networking technology relevant to the wireless communication between train and
373 ground.

374 In the preparation of this document, the following main use cases, which the train to ground
375 communication applies to, were considered:

376 a)Operational Application

- 377 1) Mission data application.
- 378 2) Driver Assistance Application
- 379 3) Energy Meter Application .

380 b)Maintenance and Commission application

- 381 1) Configuration data application.
- 382 2) Monitoring train status (e.g. telemetry).
- 383 3) Diagnostic data application.

384 c)Multimedia application

- 385 1) Passenger information application.
- 386 2) Passenger entertainment application.
- 387 3) Electronic ticketing application.
- 388 4) CCTV and video-surveillance.

389 d) Accidents/Incidents Investigation Application

- 390 1) Event Recorder Application.

391

392

393
394
395
396
397
398
399

ELECTRONIC RAILWAY EQUIPMENT – TRAIN COMMUNICATION NETWORK (TCN) – Part 2-6: On-board to ground communication

1 Scope

401 This part of IEC 61375 establishes the specification for the communication between the on-
402 board subsystems and the ground subsystems.

403 The communication system, interfaces and protocols are specified as a mobile communication
404 function, using any available wireless technology.

405 This document provides requirements in order to:

- 406 a) select the wireless network on the basis of QoS parameters requested by the application;
- 407 b) allow TCMS and/or OMTS applications, installed on-board and communicating on the on-
408 board communication network, to have a remote access to applications running on ground
409 installations;
- 410 c) allow applications running on ground installations to have a remote access to the TCMS
411 and/or OMTS applications installed on-board.

412 This document specifies further requirements which allow the applications running on-board
413 and the applications running on ground to connect each other applying the virtual/functional
414 addressing mechanism specified by IEC 61375-2-3 and exchanging application data sets
415 produced or consumed by the on-board functions implemented in the devices attached to the
416 TCN network.

417 Furthermore, this document covers the security requirements in order to grant the access only
418 to authenticated and authorised applications and to allow encryption of exchanged data.

419 Note 1: This part specifies the application agnostic communication protocols.

420 Note 2: With respect to cybersecurity this standard specifies usage of some protocols to
421 ensure interoperability. Further cybersecurity requirements are addressed by standards
422 addressing them (e.g., IEC 62443 and CLC/TS 50701).

423 Note 3: This part defines communication protocols for non-safety-related applications. It is up
424 to the user to employ suitable higher-layer safety protocols should the communication channel
425 be used for such applications.

426 Note 4: This part solely defines the interface between the MCG and GCG, their respective
427 northbound interfaces are out of scope of this part.

428
429