

SLOVENSKI STANDARD

SIST EN 61158-4-19:2015

01-marec-2015

Nadomešča:
SIST EN 61158-4-19:2012

**Industrijska komunikacijska omrežja - Specifikacije za procesna vodila - 4-19. del:
Specifikacija protokola na ravni podatkovnih povezav - Elementi tipa 19 (IEC 61158
-4-19:2014)**

Industrial communication networks - Fieldbus specifications - Part 4-19: Data-link layer protocol specification - Type 19 elements (IEC 61158-4-19:2014)

iTeh STANDARD PREVIEW

Industrielle Kommunikationsnetze - Feldbusse - Teil 4-19: Protokollspezifikation des Data Link Layer (Sicherungsschicht) - Typ 19-Elemente (IEC 61158-4-19:2014)

[SIST EN 61158-4-19:2015](#)

Réseaux de communication industriels des Spécifications des bus de terrain - Partie 4-19: Spécification du protocole de la couche liaison de données - Eléments de type 19 (CIE 61158-4-19:2014)

Ta slovenski standard je istoveten z: **EN 61158-4-19:2014**

ICS:

25.040.40	Merjenje in krmiljenje industrijskih postopkov	Industrial process measurement and control
35.100.20	Podatkovni povezovalni sloj	Data link layer
35.110	Omreževanje	Networking

SIST EN 61158-4-19:2015

[en,fr,de](#)

**iTeh STANDARD PREVIEW
(standards.iteh.ai)**

SIST EN 61158-4-19:2015

<https://standards.iteh.ai/catalog/standards/sist/bda811e3-d1ab-46b0-bc46-405c2fba11cd/sist-en-61158-4-19-2015>

EUROPEAN STANDARD
NORME EUROPÉENNE
EUROPÄISCHE NORM

EN 61158-4-19

October 2014

ICS 25.040.40; 35.100.20; 35.110

Supersedes EN 61158-4-19:2012

English Version

**Industrial communication networks - Fieldbus specifications -
Part 4-19: Data-link layer protocol specification - Type 19
elements
(IEC 61158-4-19:2014)**

Réseaux de communication industriels - Spécifications des
bus de terrain - Partie 4-19: Spécification du protocole de la
couche liaison de données - Eléments de type 19
(CEI 61158-4-19:2014)

Industrielle Kommunikationsnetze - Feldbusse - Teil 4-19:
Protokollspezifikation des Data Link Layer
(Sicherungsschicht) - Typ 19-Elemente
(IEC 61158-4-19:2014)

This European Standard was approved by CENELEC on 2014-09-19. CENELEC members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this European Standard the status of a national standard without any alteration.

iTeh STANDARD PREVIEW
Up-to-date lists and bibliographical references concerning such national standards may be obtained on application to the CEN-CENELEC Management Centre or to any CENELEC member.
(standards.iteh.ai)

This European Standard exists in three official versions (English, French, German). A version in any other language made by translation under the responsibility of a CENELEC member into its own language and notified to the CEN-CENELEC Management Centre has the same status as the official versions.

<https://standards.iteh.ai/catalog/standards/sist/bda811e3-d1ab-46b0-bc46-405c2fba11cd/sist-en-61158-4-19-2015>

CENELEC members are the national electrotechnical committees of Austria, Belgium, Bulgaria, Croatia, Cyprus, the Czech Republic, Denmark, Estonia, Finland, Former Yugoslav Republic of Macedonia, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, the Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and the United Kingdom.



European Committee for Electrotechnical Standardization
Comité Européen de Normalisation Electrotechnique
Europäisches Komitee für Elektrotechnische Normung

CEN-CENELEC Management Centre: Avenue Marnix 17, B-1000 Brussels

Foreword

The text of document 65C/762/FDIS, future edition 3 of IEC 61158-4-19, prepared by SC 65C "Industrial networks" of IEC/TC 65 "Industrial-process measurement, control and automation" was submitted to the IEC-CENELEC parallel vote and approved by CENELEC as EN 61158-4-19:2014.

The following dates are fixed:

- latest date by which the document has to be implemented at national level by publication of an identical national standard or by endorsement (dop) 2015-06-19
- latest date by which the national standards conflicting with the document have to be withdrawn (dow) 2017-09-19

This document supersedes EN 61158-4-19:2012.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. CENELEC [and/or CEN] shall not be held responsible for identifying any or all such patent rights.

iTeh STANDARD PREVIEW
This document has been prepared under a mandate given to CENELEC by the European Commission and the European Free Trade Association.
(standards.iteh.ai)

Endorsement notice

<https://standards.iteh.ai/catalog/standards/sist/bda811e3-d1ab-46b0-bc46>

The text of the International Standard IEC 61158-4-19:2014 was approved by CENELEC as a European Standard without any modification.

In the official version, for bibliography, the following notes have to be added for the standards indicated:

IEC 61131 Series	NOTE	Harmonised as EN 61131 Series
IEC 61158-1:2014	NOTE	Harmonised as EN 61158-1:2014
IEC 61158-3-19:2014	NOTE	Harmonised as EN 61158-3-19:2014
IEC 61158-5-16:2007	NOTE	Harmonised as EN 61158-5-16:2007
IEC 61158-5-19:2014	NOTE	Harmonised as EN 61158-5-19:2014
IEC 61158-6-16:2007	NOTE	Harmonised as EN 61158-6-16:2007
IEC 61158-6-19:2014	NOTE	Harmonised as EN 61158-6-19:2014
IEC 61784-1	NOTE	Harmonised as EN 61784-1
IEC 61784-2	NOTE	Harmonised as EN 61784-2
IEC 61800-7 Series	NOTE	Harmonised as EN 61800-7 Series
IEC 61800-7-201	NOTE	Harmonised as EN 61800-7-201
IEC 61800-7-202	NOTE	Harmonised as EN 61800-7-202
IEC 61800-7-203	NOTE	Harmonised as EN 61800-7-203
IEC 61800-7-204	NOTE	Harmonised as EN 61800-7-204

Annex ZA (normative)

Normative references to international publications with their corresponding European publications

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

NOTE 1 When an International Publication has been modified by common modifications, indicated by (mod), the relevant EN/HD applies.

NOTE 2 Up-to-date information on the latest versions of the European Standards listed in this annex is available here: www.cenelec.eu.

<u>Publication</u>	<u>Year</u>	<u>Title</u>	<u>EN/HD</u>	<u>Year</u>
IEC 61158-4-16	2007	Industrial communication networks - Fieldbus specifications Part 4-16: Data-link layer protocol specification - Type 16 elements	EN 61158-4-16	2008
ISO/IEC 7498-1	-	Information technology - Open Systems Interconnection - Basic reference model: The basic model	-	-
ISO/IEC 7498-3	-	Information technology - Open Systems Interconnection - Basic reference model: Naming and addressing	-	-
ISO 8601	-	Data elements and interchange formats - Information interchange - Representation of dates and times	https://standards.ieee.org/catalog/standards/sist_en/6115811/standards/sist_en/61158-4-19-2015	-
ISO/IEC 8802-3	-	Information technology - Telecommunications and information exchange between systems - Local and metropolitan area networks - Specific requirements Part 3: Carrier sense multiple access with collision detection (CSMA/CD) access method and physical layer specifications	-	-
IEEE 802.3	-	IEEE Standard for Information technology - Telecommunications and information exchange between systems - Local and metropolitan area networks - Specific requirements Part 3: Carrier Sense Multiple Access with Collision Detection (CSMA/CD) Access Method and Physical Layer Specifications	-	-
IETF RFC 879	-	The TCP Maximum Segment Size and Related Topics	-	-

**iTeh STANDARD PREVIEW
(standards.iteh.ai)**

SIST EN 61158-4-19:2015

<https://standards.iteh.ai/catalog/standards/sist/bda811e3-d1ab-46b0-bc46-405c2fba11cd/sist-en-61158-4-19-2015>



INTERNATIONAL STANDARD

NORME INTERNATIONALE



**Industrial communication networks – Fieldbus specifications –
Part 4-19: Data-link layer protocol specification – Type 19 elements
(standards.iec.ai)**

**Réseaux de communication industriels – Spécifications des bus de terrain –
Partie 4-19: Spécification du protocole de la couche liaison de données –
Eléments de type 19**

INTERNATIONAL
ELECTROTECHNICAL
COMMISSION

COMMISSION
ELECTROTECHNIQUE
INTERNATIONALE

PRICE CODE
CODE PRIX **XH**

ICS 25.040.40; 35.100.20; 35.110

ISBN 978-2-8322-1727-6

**Warning! Make sure that you obtained this publication from an authorized distributor.
Attention! Veuillez vous assurer que vous avez obtenu cette publication via un distributeur agréé.**

CONTENTS

FOREWORD.....	21
INTRODUCTION.....	23
1 Scope.....	25
1.1 General	25
1.2 Specifications	25
1.3 Procedures.....	25
1.4 Applicability.....	25
1.5 Conformance.....	26
2 Normative references	26
3 Terms, definitions, symbols, acronyms, abbreviations and conventions	26
3.1 Reference model terms and definitions.....	26
3.2 Additional Type 19 terms and definitions	26
3.3 Symbols	30
3.4 Acronyms and abbreviations.....	31
3.5 Additional conventions	32
4 DL-protocol overview.....	33
4.1 Overview	33
4.2 General DLPDU identification.....	34
4.3 General DLPDU structure	35
4.4 DLPDU header	35
4.5 MDT DLPDU	36
4.6 AT DLPDU	48
4.7 Mechanisms of connection	59
5 DL management	69
5.1 Overview	69
5.2 Initialization of cyclic communication	69
5.3 Network topologies	91
5.4 Redundancy of RT communication with ring topology	102
5.5 Hot-plug procedure	105
5.6 Status procedures	110
6 Data transmission methods	111
6.1 Overview	111
6.2 Service channel (SVC)	111
6.3 RT Channel	125
6.4 Transmission and activation of Type 19 time	125
6.5 Multiplexing of real-time data with data containers	127
6.6 Handling of Real-time bits	138
6.7 SMP	141
6.8 Oversampling	146
7 Telegram timing and DLPDU handling	151
7.1 Communication mechanisms	151
7.2 Synchronization.....	206
7.3 Processing methods of connection data	215
8 Communication Error handling and monitoring.....	218
8.1 Invalid telegrams	218

8.2	Response to MDT and AT telegram failure	218
8.3	Error counters in the slave	219
8.4	Status codes of Type 19 communication profile (SCP).....	219
8.5	Priority of diagnosis classes	222
	Annex A (normative) IDN – Identification numbers	223
A.1	IDN specification	223
A.1.1	Introduction	223
A.1.2	Element 1: structure of IDN	223
A.1.3	Element 2: structure of name	224
A.1.4	Element 3: structure of attribute.....	225
A.1.5	Element 4: structure of unit.....	227
A.1.6	Element 5: structure of minimum value	227
A.1.7	Element 6: structure of maximum value	228
A.1.8	Element 7: structure of operation data	228
A.1.9	Structure of Data status	230
A.2	Identification numbers in numerical orders	231
A.3	Detailed specification of communication-related IDNs	235
A.3.1	IDN S-0-0014 Interface status	235
A.3.2	IDN S-0-0021 IDN-list of invalid operation data for CP2	236
A.3.3	IDN S-0-0026 IDN allocation of producer RTB word container.....	237
A.3.4	IDN S-0-0027 IDN allocation of consumer RTB word container	238
A.3.5	IDN S-0-0127 CP3 transition check	239
A.3.6	IDN S-0-0128 CP4 transition check	239
A.3.7	IDN S-0-0144 Producer RTB word container	240
A.3.8	IDN S-0-0145 Consumer RTB word container	240
A.3.9	IDN S-0-0187 IDN-list of configurable data as producer	241
A.3.10	IDN S-0-0188 IDN-list of configurable data as consumer	242
A.3.11	IDN S-0-0328 Bit allocation of producer RTB word container.....	242
A.3.12	IDN S-0-0329 Bit allocation of consumer RTB word container	243
A.3.13	IDN S-0-0360 MDT data container A1	243
A.3.14	IDN S-0-0361 MDT data container B1	244
A.3.15	IDN S-0-0362 MDT data container A list index	245
A.3.16	IDN S-0-0363 MDT data container B list index	246
A.3.17	IDN S-0-0364 AT data container A1	247
A.3.18	IDN S-0-0365 AT data container B1	248
A.3.19	IDN S-0-0366 AT data container A list index	249
A.3.20	IDN S-0-0367 AT data container B list index	250
A.3.21	IDN S-0-0368 Data container A pointer	251
A.3.22	IDN S-0-0369 Data container B pointer	252
A.3.23	IDN S-0-0370 MDT data container A/B configuration list	254
A.3.24	IDN S-0-0371 AT data container A/B configuration list	254
A.3.25	IDN S-0-0394 List IDN	255
A.3.26	IDN S-0-0395 List index	255
A.3.27	IDN S-0-0396 Number of list elements	256
A.3.28	IDN S-0-0397 List segment	257
A.3.29	IDN S-0-0398 IDN list of configurable real-time bits as producer	258
A.3.30	IDN S-0-0399 IDN list of configurable real-time bits as consumer.....	258
A.3.31	IDN S-0-0444 IDN-list of configurable data in the AT data container.....	259

A.3.32	IDN S-0-0445 IDN-list of configurable data in the MDT data container.....	259
A.3.33	IDN S-0-0450 MDT data container A2	260
A.3.34	IDN S-0-0451 MDT data container A3	260
A.3.35	IDN S-0-0452 MDT data container A4	261
A.3.36	IDN S-0-0453 MDT data container A5	262
A.3.37	IDN S-0-0454 MDT data container A6	263
A.3.38	IDN S-0-0455 MDT data container A7	264
A.3.39	IDN S-0-0456 MDT data container A8	265
A.3.40	IDN S-0-0457 MDT data container A9	266
A.3.41	IDN S-0-0458 MDT data container A10	267
A.3.42	IDN S-0-0459 MDT data container B2	268
A.3.43	IDN S-0-0480 AT data container A2	269
A.3.44	IDN S-0-0481 AT data container A3	270
A.3.45	IDN S-0-0482 AT data container A4	271
A.3.46	IDN S-0-0483 AT data container A5	272
A.3.47	IDN S-0-0484 AT data container A6	273
A.3.48	IDN S-0-0485 AT data container A7	274
A.3.49	IDN S-0-0486 AT data container A8	275
A.3.50	IDN S-0-0487 AT data container A9	276
A.3.51	IDN S-0-0488 AT data container A10	277
A.3.52	IDN S-0-0489 AT data container B	278
A.3.53	IDN S-0-0490 MDT data container A2 configuration list.....	279
A.3.54	IDN S-0-0491 MDT data container A3 configuration list.....	280
A.3.55	IDN S-0-0492 MDT data container A4 configuration list.....	281
A.3.56	IDN S-0-0493 MDT data container A5 configuration list..... 405c2fa11cd/sist-en-61158-4-19-2015	281
A.3.57	IDN S-0-0494 MDT data container A6 configuration list.....	282
A.3.58	IDN S-0-0495 MDT data container A7 configuration list.....	283
A.3.59	IDN S-0-0496 MDT data container A8 configuration list.....	283
A.3.60	IDN S-0-0497 MDT data container A9 configuration list.....	284
A.3.61	IDN S-0-0498 MDT data container A10 configuration list.....	284
A.3.62	IDN S-0-0500 AT data container A2 configuration list.....	285
A.3.63	IDN S-0-0501 AT data container A3 configuration list.....	286
A.3.64	IDN S-0-0502 AT data container A4 configuration list.....	286
A.3.65	IDN S-0-0503 AT data container A5 configuration list.....	287
A.3.66	IDN S-0-0504 AT data container A6 configuration list.....	288
A.3.67	IDN S-0-0505 AT data container A7 configuration list.....	288
A.3.68	IDN S-0-0506 AT data container A8 configuration list.....	289
A.3.69	IDN S-0-0507 AT data container A9 configuration list.....	289
A.3.70	IDN S-0-0508 AT data container A10 configuration list.....	290
A.3.71	IDN S-0-1000.0.1 Active SCP Classes	291
A.3.72	IDN S-0-1000 SCP Type & Version	291
A.3.73	IDN S-0-1002 Communication cycle time	294
A.3.74	IDN S-0-1003 Allowed MST losses in CP3/CP4	294
A.3.75	IDN S-0-1005 Minimum feedback processing time (t_5)	295
A.3.76	IDN S-0-1006 AT transmission starting time (t_1)	296
A.3.77	IDN S-0-1007 Synchronization time (Tsync)	297
A.3.78	IDN S-0-1008 Command value valid time (t_3).....	298
A.3.79	IDN S-0-1009 Device Control (C-DEV) offset in MDT	298

A.3.80	IDN S-0-1010 Lengths of MDTs	299
A.3.81	IDN S-0-1011 Device Status (S-DEV) offset in AT	301
A.3.82	IDN S-0-1012 Lengths of ATs	302
A.3.83	IDN S-0-1013 SVC offset in MDT	303
A.3.84	IDN S-0-1014 SVC offset in AT	304
A.3.85	IDN S-0-1015 Ring delay	305
A.3.86	IDN S-0-1016 Slave delay (P/S).....	306
A.3.87	IDN S-0-1017 UC channel transmission time.....	306
A.3.88	IDN S-0-1019 MAC address	307
A.3.89	IDN S-0-1020.0.1 Current IP address	308
A.3.90	IDN S-0-1020 IP address	309
A.3.91	IDN S-0-1021.0.1 Current subnet mask.....	310
A.3.92	IDN S-0-1021 Subnet mask.....	310
A.3.93	IDN S-0-1022.0.1 Current gateway address	311
A.3.94	IDN S-0-1022 Gateway address	312
A.3.95	IDN S-0-1023 SYNC jitter.....	313
A.3.96	IDN S-0-1024 SYNC delay measuring procedure command	314
A.3.97	IDN S-0-1026 Version of communication hardware	315
A.3.98	IDN S-0-1027.0.1 Requested MTU	315
A.3.99	IDN S-0-1027.0.2 Effective MTU	317
A.3.100	IDN S-0-1028 Error counter MST P/S.....	317
A.3.101	IDN S-0-1031 Test pin assignment Port 1 & Port 2	318
A.3.102	IDN S-0-1034 PHY error counter Port 1 & Port 2	319
A.3.103	IDN S-0-1035 Error counter Port 1 & Port 2	320
A.3.104	IDN S-0-1036 Inter Frame Gap	322
A.3.105	IDN S-0-1037 Slave jitter	323
A.3.106	IDN S-0-1039.0.1 Current active hostname	323
A.3.107	IDN S-0-1039 Hostname	324
A.3.108	IDN S-0-1040 Sub-device address	325
A.3.109	IDN S-0-1041 AT Command value valid time (t9)	326
A.3.110	IDN S-0-1044 Device Control (C-DEV)	326
A.3.111	IDN S-0-1045 Device Status	327
A.3.112	IDN S-0-1047 Maximum Consumer Activation Time (t11)	329
A.3.113	IDN S-0-1048 Activate network settings	330
A.3.114	IDN S-0-1046 List of device addresses in device.....	331
A.3.115	IDN S-0-1050.x.1 Connection setup	332
A.3.116	IDN S-0-1050.x.2 Connection Number	333
A.3.117	IDN S-0-1050.x.3 Telegram assignment	334
A.3.118	IDN S-0-1050.x.4 Max. Length of Connection.....	335
A.3.119	IDN S-0-1050.x.5 Current length of connection	336
A.3.120	IDN S-0-1050.x.6 Configuration List.....	336
A.3.121	IDN S-0-1050.x.7 Assigned connection capability	337
A.3.122	IDN S-0-1050.x.8 Connection Control	338
A.3.123	IDN S-0-1050.x.10 Producer cycle time.....	338
A.3.124	IDN S-0-1050.x.11 Allowed Data Losses	339
A.3.125	IDN S-0-1050.x.12 Error Counter Data Losses	339
A.3.126	IDN S-0-1050.x.20 IDN Allocation of real-time bit.....	340
A.3.127	IDN S-0-1050.x.21 IDN Allocation of real-time bit.....	340
A.3.128	IDN S-0-1051 Image of connection setups	341

A.3.129	IDN S-0-1060.x.1 Default configuration	342
A.3.130	IDN S-0-1060.x.2 Configuration mask	342
A.3.131	IDN S-0-1060.x.3 Maximum quantity of this connection capability	343
A.3.132	IDN S-0-1060.x.4 Max. connection length of connection capability	343
A.3.133	IDN S-0-1060.x.6 Configurable IDNs of connection capability	344
A.3.134	IDN S-0-1060.x.7 Maximum processing time	344
A.3.135	IDN S-0-1060.x.10 Minimum producer cycle time	345
A.3.136	IDN S-0-1061 Maximum TSref-Counter	346
A.3.137	IDN S-0-1080.x.02 Producer RTB list container.....	346
A.3.138	IDN S-0-1080.x.03 IDN allocation of producer RTB list container	347
A.3.139	IDN S-0-1080.x.04 Bit allocation of producer RTB list container	348
A.3.140	IDN S-0-1081.x.02 Consumer RTB list container.....	348
A.3.141	IDN S-0-1081.x.03 IDN allocation of consumer RTB list container.....	349
A.3.142	IDN S-0-1081.x.04 Bit allocation of consumer RTB list container.....	349
A.3.143	IDN S-0-1099.0.1 Test-IDN Control for SCP Conformity Purpose	350
A.3.144	IDN S-0-1099.0.2 Test-IDN Container for SCP Conformity purpose....	351
A.3.145	IDN S-0-1100.0.1 Diagnostic counter sent SMP fragments.....	352
A.3.146	IDN S-0-1100.0.2 Diagnostic counter received SMP fragments	352
A.3.147	IDN S-0-1100.0.3 Diagnostic counter discarded SMP fragments	353
A.3.148	IDN S-0-1101.x.1 SMP Container Data	353
A.3.149	IDN S-0-1101.x.2 List of session identifiers.....	354
A.3.150	IDN S-0-1101.x.3 List of session priorities	355
A.3.151	IDN S-0-1150.x.01 OVS Control (C-OVS).....	355
A.3.152	IDN S-0-1150.x.02 OVS Status (S-OVS)	356
A.3.153	IDN S-0-1150.x.03 OVS Container.....	357
A.3.154	IDN S-0-1150.x.04 Sample time	358
A.3.155	IDN S-0-1150.x.05 Phase shift	359
A.3.156	IDN S-0-1150.x.06 Configuration List OVS - IDNs	359
A.3.157	IDN S-0-1150.x.07 Configuration List OVS - Offset	360
A.3.158	IDN S-0-1150.x.08 Configuration List OVS - Length	361
A.3.159	IDN S-0-1150.x.09 Assigned Oversampling Capability	361
A.3.160	IDN S-0-1150.x.10 Number of Samples	362
A.3.161	IDN S-0-1151.x.01 Maximum number of samples	362
A.3.162	IDN S-0-1151.x.02 Internal resolution	363
A.3.163	IDN S-0-1151.x.03 Maximum quantity of this oversampling capability	364
A.3.164	IDN S-0-1151.x.04 Minimum sample time.....	364
A.3.165	IDN S-0-1151.x.06 Configurable IDNs of OVS capability	365
A.3.166	IDN S-0-1151.x.07 Configurable IDNs of OVS Capability - Offset.....	366
A.3.167	IDN S-0-1151.x.08 Configurable IDNs of OVS Capability - Length.....	366
A.3.168	IDN S-0-1153 Amount of OVS Domains	367
Annex B (normative)	SCP– Classification.....	368
B.1	General concept of profiling.....	368
B.2	Function Groups related to the SCP	369
B.2.1	FG SCP Identification	369
B.2.2	FG Timing	369
B.2.3	FG Telegram Setup	369
B.2.4	FG Control.....	370
B.2.5	FG Bus-Diagnosis	370

B.2.6	FG Connection	370
B.2.7	FG NRT	371
B.2.8	FG MUX	371
B.2.9	FG SMP	372
B.2.10	FG RTB	373
B.3	Type 19 communication classes	373
B.3.1	General	373
B.3.2	SCP_FixCFG	373
B.3.3	SCP_FixCFG_0x02	375
B.3.4	SCP_FixCFG_0x03	375
B.3.5	SCP_VarCFG	375
B.3.6	SCP_VarCFG_0x02	376
B.3.7	SCP_VarCFG_0x03	377
B.3.8	SCP_Sync	377
B.3.9	SCP_Sync	377
B.3.10	SCP_Sync_0x02	378
B.3.11	SCP_Sync_0x03	378
B.3.12	SCP_WD	378
B.3.13	SCP_WD_0x02	378
B.3.14	SCP_Diag	379
B.3.15	SCP_RTBLIST	379
B.3.16	SCP_HP	379
B.3.17	SCP_SMP	379
B.3.18	SCP_Mux	380
B.3.19	SCP_Ext_Mux	380
B.3.20	SCP_NRT	380
B.3.21	SCP_Sig	381
B.3.22	SCP_ListSeg	381
B.3.23	SCP_IPS	381
B.3.24	SCP_Cap	381
B.3.25	SCP_RTBLListProd	382
B.3.26	SCP_RTBLListCons	382
B.3.27	SCP_SysTime	382
B.3.28	SCP_RTBWWordProd	382
B.3.29	SCP_RTBWWordCons	382
B.3.30	SCP_SafetyCon	383
B.3.31	SCP_OvS_Basic	383
B.3.32	SCP_NRTPC	384
B.3.33	SCP_Cyc	384
Annex C (normative)	GDP (Generic Device Profile)	385
C.1	General	385
C.2	Function Groups	385
C.2.1	Function Group Diagnosis	385
C.2.2	Function Group Archiving	387
C.2.3	Function Group Administration	387
C.2.4	Function Group Identification	387
C.2.5	Function Group State machine	388
C.2.6	Function Group Time	392
C.2.7	Function Group Conformance Test GDP	393

C.3	Classification.....	393
C.3.1	General	393
C.3.2	GDP_Basic.....	393
C.3.3	GDP_DiagT	393
C.3.4	GDP_DiagTAdv	394
C.3.5	GDP_LNg	394
C.3.6	GDP_PWD	394
C.3.7	GDP_Id	394
C.3.8	GDP_Rev	394
C.3.9	GDP_QA	395
C.3.10	GDP_CKs.....	395
C.3.11	GDP_CKsUser.....	395
C.3.12	GDP_StM	395
C.3.13	GDP_BKP	395
C.3.14	GDP_BKPAdv.....	396
C.3.15	GDP_RST	396
C.3.16	GDP_CIPSafetyDev.....	396
C.4	List of all GPD related IDNs.....	396
C.4.1	IDN specification	396
C.4.2	Identification numbers in numerical orders.....	396
C.4.3	Detailed specification of communication-related IDNs.....	398
C.5	GDP status codes	443
	Bibliography.....	445

SIST EN 61158-4-19:2015

Figure 1 – Example of offsets within MDTg payload.....	42
Figure 2 – Example of Offsets within AT payload	54
Figure 3 – Flow of application data	60
Figure 4 – Telegram assignment and connection length.....	61
Figure 5 – Connection control state machine producer.....	63
Figure 6 – Connection control state machine consumer	66
Figure 7 – Communication phase (CP) state machine	71
Figure 8 – CPSwitch state machine master	78
Figure 9 – CPSwitch state machine of the slave.....	83
Figure 10 – Address allocation with line	90
Figure 11 – Address allocation with ring.....	90
Figure 12 – Address allocation with interrupted ring	91
Figure 13 – Ring topology with P&S channel.....	92
Figure 14 – Line topology with P channel (as example).....	93
Figure 15 – Block diagram of a slave	93
Figure 16 – Topology conditions of a slave	94
Figure 17 – Addressing of multi-slave device	95
Figure 18 – Multi-slave device in ring topology or not last in line topology.....	96
Figure 19 – Multi-slave device as last in line topology.....	96
Figure 20 – Multi-slave device in line (left).....	98
Figure 21 – Multi-slave device in line (right).....	98
Figure 22 – Multi-slave device in ring	98

iTech STANDARD PREVIEW**(standards.itech.ai)**

Figure 23 – Topology state machine of a slave	99
Figure 24 – Ring without break	102
Figure 25 – Ring break	103
Figure 26 – Ring break on master	103
Figure 27 – Recovery of P channel (1).....	104
Figure 28 – Recovery of P channel (2).....	104
Figure 29 – Recovery of S channel (1).....	105
Figure 30 – Recovery of S channel (2).....	105
Figure 31 – Communication phase and hot-plug state machine.....	106
Figure 32 – Service channel handling diagram.....	112
Figure 33 – Communication step proceeding diagram	113
Figure 34 – State machine for procedure command execution	122
Figure 35 – Interaction of procedure command control and acknowledgement	123
Figure 36 – Procedure command execution without interrupt	124
Figure 37 – Procedure command execution with interrupt	124
Figure 38 – Procedure command execution with error message.....	125
Figure 39 – Type 19 Time Transmission	126
Figure 40 – Data container configuration without acknowledge (slave).....	131
Figure 41 – Data container configuration with acknowledge (slave).....	132
Figure 42 – Processing of list index in the MDT data.....	133
Figure 43 – Structure of extended data container.....	136
Figure 44 – Transport container.....	142
Figure 45 – UML Sequence Diagram Multiplexing of two sessions (Example)	145
Figure 46 – Oversampling overview	147
Figure 47 – Oversampling timing input (producer).....	147
Figure 48 – Oversampling timing output (consumer)	148
Figure 49 – Oversampling state machine	150
Figure 50 – Telegram timing reference.....	152
Figure 51 – Calculation of telegram length	153
Figure 52 – Calculation of t1	154
Figure 53 – Determination of UC channel.....	156
Figure 54 – Timing diagram of CP0.....	156
Figure 55 – Timing diagram of CP1 and CP2 with 2 MDT, 2AT and UC channel.....	157
Figure 56 – Timing diagram of CP1 and CP2 with 4 MDT, 4 AT and UC channel.....	158
Figure 57 – Timing diagram of CP1 and CP2 with 2 MDT, UC channel and 2 AT	158
Figure 58 – Timing diagram of CP1 and CP2 with 4 MDT, UC channel and 4 AT	159
Figure 59 – Telegram sequence.....	160
Figure 60 – The two defined positions of the UC channel.....	161
Figure 61 – First and last transmit during UC channel.....	162
Figure 62 – Activated and deactivated collision buffer.....	163
Figure 63 – Time response of store and forward method.....	164
Figure 64 – Cut through forwarding.....	164
Figure 65 – Ethernet frame with payload	165