



SLOVENSKI STANDARD SIST-TS CLC/TS 50586:2019

01-december-2019

Odprti protokol pametnega omrežja (OSGP)

Open Smart Grid Protocol (OSGP)

Protocole ouvert pour Réseau Intelligent

Ta slovenski standard je istoveten z: **CLC/TS 50586:2019**

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ICS:

- | | | |
|-----------|---|---------------------------------|
| 33.200 | Daljinsko krmiljenje, daljinske meritve (telemetrija) | Telecontrol. Telemetry |
| 35.240.99 | Uporabniške rešitve IT na drugih področjih | IT applications in other fields |

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TECHNICAL SPECIFICATION
SPÉCIFICATION TECHNIQUE
TECHNISCHE SPEZIFIKATION

CLC/TS 50586

November 2019

ICS

English Version

Open Smart Grid Protocol (OSGP)

Protocole ouvert pour Réseau Intelligent

Open Smart Grid Protocol (OSGP)

This Technical Specification was approved by CENELEC on 2019-09-02.

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

CEN-CENELEC Management Centre: Rue de la Science 23, B-1040 Brussels

Contents

	Page
European Foreword	9
Introduction	10
1 Scope	11
2 Normative references	11
3 Terms and definitions and abbreviations	11
3.1 Terms and definitions	11
3.2 Abbreviations	16
4 PLC network management.....	18
4.1 Overview	18
4.2 Metering device lifecycle	19
4.3 ATM Protocol.....	19
4.3.1 Overview	19
4.3.2 ATM responsibilities.....	20
4.3.3 Automatic discovery	20
4.3.4 Discovery domain.....	20
4.3.5 ATM messages.....	20
4.4 Commissioning.....	24
4.4.1 Overview	24
4.4.2 Commissioning operations	25
5 OSGP Device data representation	25
5.1 General overview	25
5.2 Data types	25
5.3 Pending tables	27
5.4 Value Control Identifiers (VCI).....	28
5.5 Value	28
5.6 Register Naming Convention	28
5.7 Table and Procedure Naming Convention	28
5.8 Interface Change Alarm (ICA NACK)	29
6 Security.....	29
6.1 Overview	29
6.2 Security suites	29
6.2.1 Overview	29
6.2.2 OSGP-AES-128-PSK	29
6.2.3 OMAK	30
6.2.4 Access control	30
6.3 Hardware Lock	30
7 Device Functional Description of the case the OSGP device is an electric power metering device.....	30
7.1 Overview	30
7.2 Time-Of-Use Calendar (optional).....	30
7.2.1 Overview	30
7.2.2 Manual Override Option (optional).....	31
7.2.3 Over Power Threshold Tariff (optional).....	32
8 Clock Adjustment (mandatory)	32
8.1 Absolute Time Synch	32
8.1.1 General.....	32
8.1.2 Clock Adjustment by Delta	32
8.2 Billing Functions.....	33

8.2.1	Self Reads (mandatory)	33
8.2.2	Total Energy (optional)	33
8.2.3	On-Demand Read of Current Billing Register Values (mandatory).....	33
8.3	Load Profile (mandatory)	33
8.3.1	Overview.....	33
8.3.2	Use case: Reading Load Profile Data	34
8.3.3	Use case: Parsing M-Bus Load Profile Data.....	35
8.4	Self-Test (Alarms, Error Codes) (optional)	36
8.5	Pulse Inputs (optional).....	36
8.6	Power Quality (optional)	37
8.6.1	Functional Description.....	37
8.7	Display (optional)	38
8.7.1	Overview.....	38
8.7.2	Display Source List (optional).....	38
8.7.3	Display configuration (optional)	42
8.7.4	Error Codes Configuration (optional).....	42
8.7.5	Simulated Wheel Rotation Configuration (optional).....	42
8.7.6	Disconnect Configuration (optional)	42
8.7.7	CT and VT Ration (optional)	43
8.7.8	Firmware version on Power-Up (optional).....	43
8.7.9	PLC signal quality Icons (optional)	43
8.7.10	Scheduled Display Messages (optional).....	43
8.8	Local Disconnect Contactor (optional)	43
8.8.1	Overview.....	43
8.8.2	Maximum Power and Current Level Thresholds.....	44
8.8.3	Prepaid Metering (optional).....	46
8.8.4	Local Manual Control (optional)	46
8.8.5	Load Contactor Remote Control (optional).....	46
8.9	Control Relay (optional).....	47
8.9.1	Overview.....	47
8.9.2	Control Relay Randomization.....	47
8.9.3	Time-Based Control Relay Calendar.....	47
8.9.4	Remote Control.....	48
8.10	History Log (optional)	48
8.10.1	Overview.....	48
8.10.2	Critical event (optional).....	48
8.10.3	Critical event Categories	49
8.11	One-Time Reads (optional).....	50
8.12	Group Broadcast (optional).....	51
8.13	Demand Metering (optional)	51
8.13.1	Overview.....	51
8.13.2	Demand Values (optional)	52
8.14	Test Mode.....	54
8.15	MEP Device Overview	55
8.15.1	General	55
8.15.2	Downlink Data Transfer	55
8.15.3	Uplink Data Transfer	59
8.16	M-Bus Device support (optional)	66
8.16.1	Overview.....	66
8.16.2	Billing Data Collection	66
8.16.3	Auto-discovery	69
8.16.4	Device Removal.....	69
8.16.5	M-Bus Status and Alarms.....	69
8.17	Compatibility Setting (mandatory).....	69
9	Basic OSGP services	70
9.1	Overview.....	70
9.2	Matching of requests and responses.....	70
9.3	Buffer restrictions	70
9.4	Full Table Read service.....	70

CLC/TS 50586:2019 (E)

9.4.1	Request.....	70
9.4.2	Full Read Response	71
9.5	Full Table write service	71
9.5.1	Request.....	71
9.5.2	Response.....	72
9.6	Partial table read.....	72
9.6.1	Request.....	72
9.6.2	Response.....	73
9.7	Partial table write	73
9.7.1	Request.....	73
9.7.2	Response.....	73
9.8	Response error codes.....	73
9.9	Transactions.....	75
9.10	Procedure invocation	76
9.10.1	Overview.....	76
9.10.2	Procedure Timing	77
9.10.3	Slow and Non-Responsive Procedures.....	77
Annex A	(normative) Basic Tables.....	79
A.1	Basic Table 00 (BT00): General configuration.....	79
A.2	Basic Table 01 (BT01): General Manufacturer Identification	95
A.3	Basic Table 02 (BT02): Device Nameplate	96
A.4	Basic Table 03 (BT03): End Device Mode Status	98
A.5	Basic Table 04 (BT04) Pending Status	101
A.6	Basic Table 05 (BT05): Device Identification	103
A.7	Basic Table 06 (BT06) Utility Information.....	103
A.8	Basic Table 07 (BT07): Procedure Initiate.....	104
A.9	Basic Table 08 (BT08): Procedure Response	104
A.10	Basic Table 10 (BT10): Dimension Sources Limiting.....	105
A.11	Basic Table 12 (BT12): Unit of Measure Entry	106
A.12	Basic Table 13 (BT13): Demand Control.....	108
A.13	Basic Table 15 (BT15): Constants.....	109
A.14	Basic Table 16 (BT16): Source Definition.....	109
A.14.1	General.....	109
A.14.2	Measurement Source Definition Records	110
A.14.3	Extended Source IDs	120
A.15	Basic Table 20 (BT20): Dimension Register	121
A.16	Basic Table 21 (BT21): Actual Register.....	122
A.17	Basic Table 22 (BT22): Data Selection	123
A.18	Basic Table 23 (BT23): Current Register Data	124
A.19	Basic Table 24 (BT24): Previous Season Data	126
A.20	Basic Table 25 (BT25): Previous Demand Reset Data	126
A.21	Basic Table 26 (BT26): Self Read Data	126
A.22	Basic Table 27 (BT27): Present Register Selection.....	127
A.23	Basic Table 28 (BT28): Present Register Data.....	127
A.24	Basic Table 30 (BT30): Dimension Display	129
A.25	Basic Table 33 (BT33): Primay Display List.....	129
A.26	Basic Table 50 (BT50): Dimension Time and TOU	130
A.27	Basic Table 52 (BT52): Clock.....	131
A.28	Basic Table 53 (BT53): Time Offset.....	132
A.29	Basic Table 54 (BT54): Calendar	132
A.30	Basic Table 55 (BT55): Clock state	134
A.31	Basic Table 60 (BT60): Dimension Load Profile	135
A.32	Basic Table 61 (BT61): Actual Load Profile	137
A.33	Basic Table 62 (BT62): Load Profile Control.....	138
A.34	Basic Table 63 (BT63): Load Profile Status	139
A.35	Basic Table 64 (BT64): Load Profile Data.....	140
A.36	Basic Table 70 (BT70): Dimension Log	143
A.37	Basic Table 71 (BT71): Actual Log.....	143
A.38	Basic Table 72 (BT72): Events Identification	144

A.39	Basic Table 73 (BT73): History Log Control	160
A.40	Basic Table 74 (BT74): History Log Data	160
A.41	Basic Table 4150 (BT4150): Pending TOU Calendar.....	161
Annex B	(normative) Extended Tables.....	163
B.1	Extended Table 00 (ET00) (2048): Manufacturer Specific	163
B.2	Extended Table 01 (ET01) (2049): Manufacturer Specific	163
B.3	Extended Table 02 (ET02) (2050): RTC calibration	163
B.4	Extended Table 03 (ET03) (2051): Utility Information	163
B.5	Extended Table 04 (ET04) (2052): System Information	165
B.6	Extended Table 05 (ET05) (2053): Control Output Settings	171
B.7	Extended Table 06 (ET06) (2054): Pulse Inputs.....	180
B.8	Extended Table 07 (ET07) (2055): Display Configuration.....	181
B.9	Extended Table 08 (ET08) (2056): Manufacturer Specific	184
B.10	Extended Table 09 (ET09) (2057): Power Quality	184
B.11	Extended Table 10 (ET10) (2058): Internal Power Outages.....	189
B.12	Extended Table 11 (ET11) (2059): MFG Dimension.....	189
B.13	Extended Table 12 (ET12) (2060): Daily Consumption	191
B.14	Extended Table 13 (ET13) (2061): M-Bus/MEP Device config.....	191
B.15	Extended Table 14 (ET14) (2062): M-Bus/MEP Device Status	194
B.16	Extended Table 15 (ET15) (2063): MEP On-demand Requests	197
B.17	Extended Table 17 (ET17) (2065): Code Bank Info.....	199
B.18	Extended Table 18 (ET18) (2066): Manufacturer Specific	201
B.19	Extended Table 19 (ET20) (2067): Meter One-Time Read Queue.....	201
B.20	Extended Table 20 (ET20) (2068): M-Bus One Time Read Queue	202
B.21	Extended Table 21 (ET21) (2069): Load Profile Internam Configuration	202
B.22	Extended Table 22 (ET22) (2070): Error Codes Configuration	204
B.23	Extended Table 27 (ET27) (2075): Transaction Request Table	205
B.24	Extended Table 28 (ET28) (2076): Transaction Response Table.....	206
B.25	Extended Table 29 (ET29) (2077): Hardware Configurations	206
B.26	Extended Table 30 (ET30) (2078): Maximum power or current level control	209
B.27	Extended Table 31 (ET31) (2079): Meter One-Time Read Log	209
B.28	Extended Table 32 (ET32) (2080): MEP One-Time Read Log	211
B.29	Extended Table 33 (ET33) (2033): Group Configuration.....	212
B.30	Extended Table 34 (ET34) (2082): MEP Device Configuration 2	213
B.31	Extended Table 35 (ET35) (2083): Manufacturer Specific	214
B.32	Extended Table 36 (ET36) (2084): Mfg Actual Dimensions	214
B.33	Extended Table 37 (ET37) (2085): Build Information	216
B.34	Extended Table 38 (ET38) (2086): Manufacturer Specific	216
B.35	Extended Table 39 (ET39) (2087): Previous Demand.....	216
B.36	Extended Table 40 (ET40) (2088): Demand Configuration	216
B.37	Extended Table 41 (ET41) (2089): Historical Demand Reset Log.....	217
B.38	Extended Table 42 (ET42) (2090): Interface Definition	219
B.39	Extended Table 43 (ET43) (2091): Test Mode Configuration.....	223
B.40	Extended Table 44 (ET44) (2092): Test Mode Status	224
B.41	Extended Table 45 (ET45) (2093): MEP Recurring Read Log.....	224
B.42	Extended Table 46 (ET46) (2094): Control Output Read Only Data.....	225
B.43	Extended Table 47 (ET47) (2095): Calendar Override Settings	226
B.44	Extended Table 48 (ET48) (2096): Feature Activation Table	226
B.45	Extended Table 49 (ET49) (2097): LCD Output Table	227
B.46	Extended Table 50 (ET50) (2098): MEP Inbound Data Space	227
B.47	Extended Table 51 (ET51) (2099): MEP Device Configuration	229
B.48	Extended Table 52 (ET52) (2100): MEP Transaction Request Table	229
B.49	Extended Table 53 (ET53) (2101): MEP Transaction Response Table	229
B.50	Extended Table 54 (ET54) (2102): Meter Status	230
B.51	Extended Table 55 (ET55) (2103): Meter Configuration.....	233
B.52	Extended Table 56 (ET56) (2104): Load side state calibration	238
B.53	Extended Table 57 (ET57) (2105): M-Bus Data Type Table	239
B.54	Extended Table 58 (ET58) (2106): MEA Status Extension.....	240
B.55	Extended Table 59 (ET59) (2107): MEP Procedure Response	240

CLC/TS 50586:2019 (E)

B.56	Extended Table 60 (ET60) (2108): Configurable Energy Accumulator Settings	241
B.57	Extended Table 61 (ET61) (2109): Time-Based Relay Control	241
B.58	Extended Table 62 (ET62) (2110): Load profile Display Configuration	242
B.59	Extended Table 66 (ET66) (2114): Load Profile Source ID Mapping Table	244
B.60	Extended Table 67 (ET67) (2115): Display Source ID Mapping Table	244
B.61	Extended Table 68 (ET68) (2116): Critical Events	245
B.62	Extended Table 69 (ET69) (2117): Critical Events Bitmasks	245
B.63	Extended Table 70 (ET70) (2118): RAM only status	246
B.64	Extended Table 71 (ET71) (2119): MEP Delta Data and Config	247
B.65	Extended Table 1038 (ET1038) (3086): Manufacturer Specific.....	248
B.66	Extended Table 4143 (ET4143) (6191): Calendar Override Settings.....	248
B.67	Extended Table 4156 (ET4156) (6204): Configurable Energy Accumulator Settings	248
Annex C (normative) Basic Procedures		249
C.1	Basic Procedure 04 (BP04): Reset List Pointers	249
C.2	Basic Procedure 05 (BP05): Update Last Read Entry	249
C.3	Basic Procedure 06 (BP06): Change Mode	250
C.4	Basic Procedure 10 (BP10): Set Date and Time	251
C.5	Basic Procedure 12 (BP12): Activate All Pending Tables	252
C.6	Basic Procedure 13 (BP13): Actvate Specific Pending Tables	252
C.7	Basic Procedure 14 (BP14): Clear All Pending Tables	253
C.8	Basic Procedure 15 (BP15): Clear Specific Pending Tables	254
Annex D (normative) Extended Procedures		255
D.1	Extended Procedure 00 (EP00) (2048): Manufacturer Specific	255
D.2	Extended Procedure 01 (EP01) (2049): NV Memory Refresh	255
D.3	Extended Procedure 02 (EP02) (2050): Control Output Command	255
D.4	Extended Procedure 03 (EP03) (2051): Clear Alarms.....	256
D.5	Extended Procedure 04 (EP04) (2052): Manufacturer Specific	257
D.6	Extended Procedure 05 (EP05) (2053): Manufacturer Specific	257
D.7	Extended Procedure 06 (EP06) (2054): NVM Config	257
D.8	Extended Procedure 07 (EP07) (2055): Manufacturer Specific	258
D.9	Extended Procedure 08 (EP08) (2056): Erase code memory	258
D.10	Extended Procedure 09 (EP09) (2057): Download Code Packet	259
D.11	Extended Procedure 10 (EP10) (2058): Switch Code Bank	259
D.12	Extended Procedure 11 (EP11) (2059): Configure/Reset Load Profile Data Set	260
D.13	Extended Procedure 12 (EP12) (2060): Record Self-Read.....	262
D.14	Extended Procedure 13 (EP13) (2061): Write single Bit in Table.....	262
D.15	Extended Procedure 14 (EP14) (2062): Manufacturer Specific	263
D.16	Extended Procedure 15 (EP15) (2063): Set Tariff	263
D.17	Extended Procedure 16 (EP16) (2064): Change System Clock by Delta.....	264
D.18	Extended Procedure 17 (EP17) (2065): Remove M-Bus/MEP Device	264
D.19	Extended Procedure 18 (EP18) (2066): Clear MEP Alarm.....	265
D.20	Extended Procedure 19 (EP19) (2067): Post On-demand M-Bus Request.....	266
D.21	Extended Procedure 21 (EP21) (2069): Add prepay credit	267
D.22	Extended Procedure 22 (EP22) (2070): Switch maximum power or current level	268
D.23	Extended Procedure 23 (EP23) (2071): Remote Disconnect Request.....	269
D.24	Extended Procedure 24 (EP24) (2072): Post On-Time Read Request	269
D.25	Extended Procedure 25 (EP25) (2073): Reset Extended Table Logs and Queues	270
D.26	Extended Procedure 26 (EP26) (2074): Update Mfg Lists Unread Entries	271
D.27	Extended Procedure 27 (EP27) (2075): Add/Remove Group ID	271
D.28	Extended Procedure 28 (EP28) (2076): Enable/Disable Battery.....	272
D.29	Extended Procedure 29 (EP29) (2077): Read/Write Diagnostic Counters.....	273
D.30	Extended Procedure 30 (EP30) (2078): Synchronize Disconnect Status.....	273
D.31	Extended Procedure 31 (EP31) (2079): Activate Feature.....	274
D.32	Extended Procedure 32 (EP32) (2080): Billing Dimension Configuration.....	274
D.33	Extended Procedure 33 (EP33) (2081): Billing Reconfiguration	277
D.34	Extended Procedure 34 (EP34) (2082): Demand Reset.....	278
D.35	Extended Procedure 36 (EP36) (2084): Schedule Disconnect Lock Open.....	278
D.36	Extended Procedure 37 (EP37) (2085): NVM Config	279

D.37	Extended Procedure 39 (EP39) (2087): Post MEP Data (Urgent or Non-Urgent)	280
D.38	Extended Procedure 41 (EP41) (2089): MEP Download Initialize	282
D.39	Extended Procedure 42 (EP42) (2090): Control Output Settings	283
D.40	Extended Procedure 44 (EP44) (2092): IO Control	285
D.41	Extended Procedure 45 (EP45) (2093): Manufacturer Specific	285
D.42	Extended Procedure 46 (EP46) (2094): Manufacturer Specific	285
D.43	Extended Procedure 47 (EP47) (2095): Manufacturer Specific	285
D.44	Extended Procedure 48 (EP48) (2096): Manufacturer Specific	285
D.45	Extended Procedure 49 (EP49) (2097): Manufacturer Specific	285
Annex E (normative) OSGP OMA Digest Algorithm		286
Annex F (normative) OSGP-AES-128-PSK Security Suite		288
F.1	Introduction	288
F.2	Background	289
F.2.1	System Assumptions	289
F.2.2	Threat Model	289
F.2.3	Design Goals	289
F.2.4	Inspiration	290
F.3	Terms and Notation	290
F.3.1	Terms	290
F.3.2	Notation	292
F.3.3	Other conventions	292
F.4	Cryptographic Primitives	292
F.4.1	CMAC	293
F.4.2	CCM	293
F.5	Cryptographic Functions	293
F.5.1	OSGP_KDF: Key Derivation Function	293
F.5.2	OSGP_MAC: Message Authentication Code Function	294
F.5.3	OSGP_MAC_VERIFY: Message Authentication Code Verification Function	295
F.5.4	OSGP_AE/OSGP_AD: Authenticated Encryption/Decryption Functions	295
F.5.5	OSGP_CSPRG(num_of_bytes): Cryptographically Secure Pseudo Random Number Generator	297
F.6	Keys	297
F.7	Secure Channel Initialization	299
F.7.1	Overview	299
F.7.2	Secure Channel State(CryptoContext)	299
F.7.3	Flow	300
F.7.4	Security Suite Negotiation	306
F.7.5	Meter commissioning	306
F.7.6	Error Handling and Intrusion Detection	306
F.7.7	Messages	306
F.8	Secure Channel Communication	310
F.8.1	Overview	310
F.8.2	The General Process	311
F.8.3	Unicast Communication	312
F.8.4	Broadcast Communication	316
F.9	Firmware Downloading	318
F.10	Key Management	319
F.10.1	Renewing the Short-term, Meter-unique Keys	319
F.10.2	Renewing the Short-term, Domain-unique Keys	319
F.10.3	Updating the Long-term, Meter-unique Keys	321
F.10.4	Key Validity Periods	321
F.11	Error Messages	321
F.11.1	Overview	321
F.11.2	AuthenticationFailure	321
F.11.3	SequenceError	321
F.12	Security Considerations	322
F.12.1	Reasoning	322
F.12.2	Recommendation and Guidance for Implementers	324

F.12.3	Question and Answers	326
Annex G	(normative) Repeating mechanism	328
G.1	Overview	328
G.2	Terms	328
G.3	Protocol specification	329
G.3.1	Overview	329
G.3.2	Addressing	329
G.3.3	Service Types.....	329
G.3.4	Timers	329
G.3.5	Request Flow.....	329
G.3.6	Response Flow.....	330
G.3.7	Authentication.....	330
G.3.8	Examples	331
G.3.9	Broadcast	332
G.4	Downlink Frame format.....	332
G.4.1	Overview	332
G.4.2	Proxy parameters of Request Frame	332
G.5	Uplink Frame format.....	337
G.5.1	Overview	337
G.5.2	Proxy success.....	337
G.5.3	Repeating Failure.....	337
G.5.4	Authentication Failure.....	338
	Bibliography	339

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European foreword

This document (CLC/TS 50586:2019) has been prepared by CLC/TC 13 “Electrical energy measurement and control”.

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Introduction

One of the outcomes of the mandate M/441 is the identification of OSGP as one of the protocols which can be used for Smart Metering deployment in Europe.

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1 Scope

This document describes the data interface model, application-level communication, management functionalities, and security mechanism for the exchange of data with smart-grid devices. The following five areas are referred to as the Open Smart Grid Protocol (OSGP).

- Data exchange with smart-grid devices allows Utility Suppliers to collect customer usage information such as billing data and load profiles, monitor and control grid utilization, provision scheduling of tariffs, detect theft and tampers, and to issue disconnects, to name a few. Meter features are described in Clauses 7 and 8.
- The OSGP data interface uses a representation-oriented model (tables and procedures) which require low overhead. The model is described in Clause 5, with specific tables specified in Annex A, Annex B, and procedures in Annex C and Annex D.
- The OSGP application protocol is designed to use the EN 14908-1:2014 communication stack over narrow-band power line channels. Clause 9 describes the messages that are used to access OSGP data. An essential feature of the protocol over power line channels is a repeating mechanism which gives the application layer the control and responsibility for forwarding packets among devices, independent of the routing protocol or limitations of underlying layers. Therefore OSGP can be adapted to other communication stacks and medium, although such adaptation is outside of the scope of this specification. The repeating mechanism is described in Annex G.
- OSGP management features include the discovery of devices and the routing topology in a protocol called Automated Topology Management (described in Clause 4) commissioning of devices for secured communication (Annex F), monitoring of device connectivity, and updating of device firmware.
- OSGP security covers authentication, encryption, and key management. This is detailed in Annex F.

2 Normative references

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

EN 14908-1:2014, *Information technology - Control network protocol - Part 1: Protocol stack*

ISO 8859-1 (or ECMA-94), *Information technology - 8-bit single-byte coded graphic character sets - Part 1: Latin alphabet No. 1*

ISO/IEC 646:1991, *Information technology - ISO 7-bit coded character set for information interchange*

IEEE Std 802.11ac-2013, *IEEE Standard for Information technology- Telecommunication and information exchange between systems – Local and metropolitan area networks – Specific requirements – Part 11 Wireless LAN Medium Access Control*

3 Terms, definitions and abbreviations

3.1 Terms and definitions

For the purposes of this document, the following terms and definitions apply. ISO and IEC maintain terminological databases for use in standardization at the following addresses:

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

— IEC Electropedia: available at <http://www.electropedia.org/>

CLC/TS 50586:2019 (E)

3.1.1**active energy/power**

measure of active power expended over time (resistive load)

3.1.2**apparent energy/power**

multiplication of the rms voltage with the rms current

3.1.3**Byte Encryption Key****BEK**

128-bit key derived from the OMAK for the purpose of OSGP encryption

3.1.4**Billing Interface Definition Number****BIDN**

identifier used to identify billing-related data in OSGP device logs, see table EP 32 in annex D

3.1.5**bootrom**

part of the OSGP device firmware which is fixed and cannot be changed over the network

3.1.6**broadcast**

message directed at all of the network population. In OSGP systems, only the data concentrator initiates broadcast messages

Note 1 to entry: OSGP devices may repeat a broadcast message.

3.1.7**clone domain**

special logical network address format that signals a node to receive rather than reject messages from a sender having the same source address as itself

Note 1 to entry: This facilitates the discovery process by allowing discovery messages to be propagated throughout nodes all having the same pre-assigned address, without requirement them to be commissioned. The clone domain address is distinguished from a normal address by having the node number byte's most significant bit set to zero instead of one.

Note 2 to entry: In addressing there can be up to 255 subnets and 127 nodes/subnet, so the high order bit of the node number byte is free for this special use.

3.1.8**Packet Cycle Count**

maximum number of packet cycles over which to randomize access to the link

3.1.9**Data Concentrator****DC**

gateway which supervises electrical utility OSGP devices and other devices, performing data collection and network management functions and allows access to the data and device by the HES

3.1.10**device (or OSGP device)**

device which implements the OSGP protocol

3.1.11**dip**

measured quantity detected at a level below a defined threshold

3.1.12**energy**

summation of power over time

3.1.13**Fast Commission Message****FCM**

specific OSGP message type used for PLC traffic optimization during initial commissioning of an OSGP device

3.1.14**group ID**

mechanism for selecting a subset of devices to process a broadcast message

Note 1 to entry: the group ID used in OSGP is an application-layer entity, and is unrelated to the 14908-1 Group ID which is used in the network layer.

3.1.15**in-phase**

condition when the phase angle between two sine waves is 0 degrees

3.1.16**Interface Change Alarm****ICA**

alarm bit in BT03 to indicate the possible change of the device's interface definition or dimensions of some OSGP device tables, due to modification of device tables or invocation of device procedures

Note 1 to entry: Attempts to read or write some device tables will not succeed until the alarm has been cleared by the HES to acknowledge the interface change. Tables affected by the Interface Change Alarm in this manner are marked with the ICA NACK attribute throughout the present document. Tables and procedures that may cause the Interface Change Alarm to be triggered are marked with the ICA SRC attribute throughout the present document.

3.1.17**load profile**

recording of one or more pieces of electrical load data at specified intervals

3.1.18**M-Bus**

protocol developed for networking and remote reading of utility meters that are attached (wired or wirelessly) to the smart grid device

Note 1 to entry: the M-Bus capabilities in the OSGP device according to the present document can discover and query up to four M-Bus devices, such as gas, water, or heat meters. The OSGP device stores the consumption data collected from the M-Bus devices along with any alarm or status messages.

3.1.19**M-Bus Auto-discovery**

process by which the device which play the role of the M-Bus master polls the M-Bus network for new and previously commissioned devices

Note 1 to entry: newly discovered devices are added to the commissioned device list for regular polling, up to a maximum of four devices.

3.1.20**M-Bus Data Type****MDT**

mapping of a M-bus Data Record Header (DRH) definition to a 5-bit ordinal