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Open Smart Grid Protocol (OSGP);
Smart Metering/Smart Grid Communication Protocol

Reference

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Foreword

This Technical Specification (TS) has been produced by ETSI Technical Committee Access, Terminals, Transmission and Multiplexing (ATTM).

With more than 5 million OSGP compatible smart meters and other devices already installed in Europe and around the world, OSGP has become a defacto standard for smart meters and smart grid infrastructure communications in Europe. In addition, over 30 million more electricity meters already installed in Europe are using the same power line communications technology as used by OSGP.

Consistent with the general European objective to create European standards that will enable interoperability of smart grid devices including electricity meters, which can then improve the means by which customers' awareness of actual consumption can be raised in order to allow timely adaptation to their demands (commonly referred to as 'smart metering'), the OSGP Alliance, formerly known as Energy Services Network Association (ESNA), a non-profit corporation under Dutch law, is partnering with utilities, manufacturers, system integrators and other interested parties to obtain their support for the promotion and adoption of OSGP as a European specification for smart grid communications to benefit utilities, their customers, and suppliers.

Modal verbs terminology

In the present document "**shall**", "**shall not**", "**should**", "**should not**", "**may**", "**need not**", "**will**", "**will not**", "**can**" and "**cannot**" are to be interpreted as described in clause 3.2 of the ETSI Drafting Rules (Verbal forms for the expression of provisions).

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1 Scope

The present document is a revision of ETSI TS 104 001. ETSI TS 104 001 was initially a revision of ETSI GS OSG 001 [i.5], which was originally created under the ETSI ISG OSG. The previous version of ETSI TS 104 001 was prepared by the TC PLT, but it now falls under the responsibilities of TC ATTM. This update is to ensure proper references to ANSI, IEEE and MC.

2 References

2.1 Normative references

References are either specific (identified by date of publication and/or edition number or version number) or non-specific. For specific references, only the cited version applies. For non-specific references, the latest version of the referenced document (including any amendments) applies.

Referenced documents which are not found to be publicly available in the expected location might be found at https://docbox.etsi.org/Reference/.

NOTE: While any hyperlinks included in this clause were valid at the time of publication, ETSI cannot guarantee their long term validity.

The following referenced documents are necessary for the application of the present document.

[1] BS EN 14908-1:2014: "Open data communication in building automation, controls and building management. Building network protocol. Protocol stack".

[2] BS EN 13757-2:2018: "Communication systems for meters. Wired M-Bus communication".

[3] BS EN 13757-3:201: "Communication systems for meters. Application protocols".

[4] ANSI C12.18/IEEE Std 1701™/MC12.18: Standard for Optical Port Communication Protocol to Complement the Utility Industry End Device Data Tables.

[5] ANSI C12.19/IEEE Std 1377™/MC12.19: Standard for Utility Industry Metering Communication Protocol Application Layer (End Device Data Tables).

2.2 Informative references

References are either specific (identified by date of publication and/or edition number or version number) or non-specific. For specific references, only the cited version applies. For non-specific references, the latest version of the referenced document (including any amendments) applies.

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The following referenced documents are not necessary for the application of the present document but they assist the user with regard to a particular subject area.

[i.1] ISO/IEC 646:1991: "Information technology - ISO 7-bit coded character set for information interchange".

[i.2] ISO 8859/1 (or ECMA-94): "Information technology - 8-bit single-byte coded graphic character sets - Part 1: Latin alphabet No. 1".

[i.3] IEC 61000-4-7: "Electromagnetic compatibility (EMC) - Part 4-7: Testing and measurement techniques - General guide on harmonics and interharmonics measurements and instrumentation, for power supply systems and equipment connected thereto".

[i.4] Void.

[i.5] ETSI GS OSG 001: "Open Smart Grid Protocol (OSGP)".

3 Definition of terms, symbols and abbreviations

3.1 Terms

For the purposes of the present document, the following terms apply:

active energy/power: measure of active power expended over time (resistive load)

AES: symmetric 128-bitblock data encryption technique

authentication: process where data is validated to be current and to have come from the expected source

Base Encryption Key (BEK): 128 bit key derived from the OMA Key for the purpose of OSGP encryption

Billing Interface Definition Number (BIDN): identifier used to identify billing-related data in OSGP device logs

NOTE: See tables in clause D.33.

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

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

NOTE: OSGP devices may repeat a broadcast message.

ciphertext: output of encrypting plaintext

clone domain: domain where the most significant bit of the node number assigned to all nodes is set to zero

NOTE 1: This allows the node to receive messages that are sent by a node with the same domain, subnet and node number as the clone domain node. In BS EN 14908-1:2014 [1] 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.

NOTE 2: Normally, packets from the same domain, subnet and node as your own are rejected: in the Clone domain case, this is bypassed.

cycle count: cycle count is the maximum number of packet cycles to randomize access to the link over

NOTE: So, if the cycle count is 4, the responder generates a random number between 0 and 3, multiplies the result by the packet cycle width (see below in definitions) and then waits that long before responding to the message.

Data Concentrator (DC): server which supervises electrical utility OSGP devices and other devices

device (or OSGP device): device which implements the OSGP protocol

Daylight Saving Time (DST): adjustment from solar time to provide longer evenings during summer months

digest: 8-byte data block computed using the OSGP digest algorithm

NOTE: (see annex E) Along with the Open Media Authentication Key. The digest accounts for both message data and sequence number (Reference ID).

dip: measured quantity detected at a level below a defined threshold

encryption: process where data is converted to a format that can only be understood by someone sharing the key used by the source

energy: summation of power over time

Fast Commission Message (FCM): specific message type used for PLC traffic optimization during initial commissioning of an OSGP device