



OPEN meter

Open Public Extended Network metering



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D 2.1/PART 1 AMENDMENT

DESCRIPTION OF CURRENT STATE-OF-THE-ART TECHNOLOGIES AND PROTOCOLS –

GENERAL OVERVIEW OF STATE-OF-THE-ART TECHNOLOGICAL ALTERNATIVES

DUE DELIVERY DATE:

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Document History

Vers.	Issue Date	Content and changes
0.0	16.06.2010	First draft provided by EDF (PLC G3)
0.1	16.06.2010	First draft provided by ENDESA (PLC MORE)
0.2	21.06.2010	Merged G3 and MORE to single document
0.3	28.06.2010	Editorial changes
0.4	26.07.2010	Changes/improvements according to comments
0.5	01.09.2010	Final changes after TB comments
1.0	17.09.2010	Final document

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Tomas SCHAUB



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REFERENCES

- [1] Smart Meter Coordination Group (SMCG), Final report “Standardization mandate to CEN, CENELEC and ETSI in the field of measuring instruments for the development of an open architecture for utility meters involving communication protocols enabling interoperability - M/441”, v.0.7 2009-12-10.
- [2] Smart Meter Coordination Group (SMCG), “SM-CG Technical Report on Communications”, SMCG/Sec0020/DC



1 PURPOSE

This document is an Amendment of Part 1 of deliverable D2.1 taking into account two additional technologies, "Meters and More" and "PLC G3".

2 Amendments to the core document

page	paragraph	action	amendment
46	7.2.3	Replace	Replace reference "7.2.3 Telegestore – DLC" by "7.2.5 Telegestore – DLC"
46	7.2.4	Replace	Replace reference "7.2.4 ZIV" by "7.2.6 ZIV"
46	7.2.3	Add	<p>Add a new 7.2.3 paragraph</p> <p>7.2.3 METERS AND MORE</p> <p>"Meters and More" is the specification of a complete protocol stack in a communication system for Smart Metering Solutions. Adoption, maintenance and evolution of Meters and More specification are the aims of "Meters and More Open Technologies", a no-profit association whose activities are also promoting the existence of a range of interoperable devices, applications and services, and providing a certification process to assure products compliance with Meters and More specifications.</p> <p>The low complexity of this protocol and the use of short packets permits to maximize the efficiency and robustness of transmission on a noisy physical medium like LV power line. The Meters and More PHY Layer, working on CENELEC A Band (EN 50065-1) on LV power grids, implements a standard BPSK modulation with a carrier centered @ 86 kHz frequency.</p> <p>Data link level performs messages repetition functionality to improve nodes reachability, application layer permits auto-discovering of network nodes and self reconfiguration of the network topology.</p> <p>Security is guaranteed by message authentication provided in Application Layer and packet encryption provided in data link layer, while data integrity is guaranteed by using CRC32 control at Mac and Phy</p>



			<p>layers.</p> <p>Meters and More technology is prepared for the inclusion of multi-utility metering. This extension only requires the implementation of an appropriate interface to the particular external device (for further details please refer to following documents: "SMCG Final Report" [1] and "SMCG First Draft Communication Report" [2]) and the definition of corresponding data tables without any modifications to the lower and upper communication layers or protocols.</p>
46	7.2.4	Add	<p>Add a new 7.2.4 paragraph:</p> <p>7.2.4 PLC G3</p> <p>Designed for large-scale utility infrastructures, PLC G3 solution includes OFDM-based PHY/MAC layers and a 6LoWPAN adaptation layer to transmit IPv6 packets over the powerline. Advanced modulation enables a robust data rate in extremely harsh power line channels both in LV and MV grids, cohabitation with S-FSK technology, and adaptive tone mapping to avoid interfering frequencies. Reliable data rate communications can be maintained over the long distances required by smart grid infrastructures.</p> <p>The PLC G3 solution offers:</p> <ul style="list-style-type: none"> • A robust high-performance PHY layer, based on OFDM and adapted to the PLC environment within the CENELEC A band. • A MAC layer of the IEEE 802.15.4 type, well suited to low data rates • A 6LoWPAN adaptation layer, fully compatible with IPv6, the new generation of IP (Internet Protocol), which widely opens the range of potential applications and services • Embedded functionalities for the DLMS/COSEM Metering Application layer (IEC 62056-53, IEC 62056-61 and IEC 62056-62) • A coherent security approach based on widely available security mechanisms and algorithms

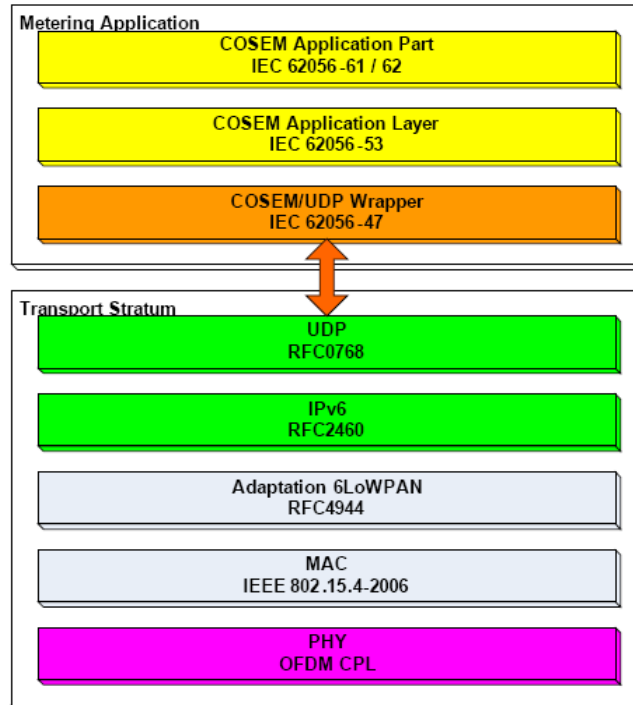


Figure 2-1 PLC G3 profile

To sum up, the PLC G3 specifications define the lower layers of an open, royalty free PLC solution within the CENELEC band. Based on an adaptive tone OFDM modulation scheme of 36 data subcarriers (from 36 kHz to 90 kHz), capable of providing efficient datarate of more than 20 kbps; the PLC G3 remains ideal support for the IPv6 protocol using the widely proven combination of both IEEE 802.15.4 MAC layer and 6LowPAN convergence layer.

51	8.4.1	Add	<p>Add a new 8.4 OPEN DATA/APPLICATION LAYERS NOT STANDARDISED</p> <p>8.4.1 METERS AND MORE</p> <p>The model describes the identification codes of the readable and programmable parameters inside a generic single-phase/polyphase (mono and bidirectional) static electrical meter.</p> <p>Data are grouped in tables, each table representing an homogeneous set of parameters.</p> <p>Each record is composed by an univocal identification code and a set of attributes like measurement unit, range</p>
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			of permitted values, length in bytes, value and name of parameter.
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NOTE: Figure captions and the table of content has to be updated in order to take into account the previously described amendments

Table 2-1 Amendments to D 2.1/Part 1



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