Unbundled Smart meters in the new smart grid era

Assessment on compatibility with European standardisation efforts

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Abstract— With the new active distribution network where distributed energy resources are increasingly present and where Smart meters will become the most ubiquitous equipment in low voltage (LV) networks, we are presenting a new Smart Meter solution and a corresponding MV/LV dispatch center to contribute to both new energy market challenges as well as to Smart Grid services and evolving requirements. We are addressing some specific aspects of observability in LV network, based on wide-spread IP communication solutions, such as Synchro-SCADA and data anonymization, and presenting network services to assist dispatch, using also background network programs in LV such as power flow and state estimator. Moreover, we are analyzing and proposing a unifying approach for both Smart Meters and Smart Grid architectures, to allow a complex Smart Grid functionality to be deployed even within the first wave of Smart metering roll-out. The concepts are in progress to be implemented in the European R&D project NOBEL GRID.

Keywords—smart meter, standardisation, SGAM

REFERENCES

[1] Nobel Grid project, www.nobelgrid.eu

[2] Mihaela Albu, M. Sănduleac, Carmen Stanescu - Syncretic use of smart meters for Power Quality monitoring in emerging networks, IEEE Transactions on Smart Grids, Volume 1, 2017

[3] M. Sănduleac, L. Pons, G. Fiorentino, R. Pop, Mihaela Albu – The unbundled Smart Meter concept in a synchro-SCADA framework, IEEE I2MTC - 2016 International Instrumentation and Measurement technology Conference, May 23-26, 2016, Taipei, Taiwan

[4] M. Sănduleac, Carmen Stanescu, N. Golovanov - Power networks observability, control and automation using Unbundled Smart Meters, 2016 International Conference on Development and Application Systems (DAS), May 2016, Suceava

[5] Aikaterini Bourazeri, J. Pitt, P. Almajano, Inmaculada Rodríguez, Maite Lopez-Sanchez - Meet the Meter: Visualising SmartGrids Using Self- Organising Electronic Institutions and Serious Games, 2012 IEEE Sixth International Conference on Self-Adaptive and Self-Organizing Systems Workshops (SASOW), Lyon, France, 10-14 Sept. 2012

[6] List of standard OBIS codes and COSEM objects, http://dlms.com/documents/members/Object_defs_v3.0_170127.zip, accessed on 28.01.2017

[7] M/441 Mandate, M/441 Standardisation 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, EU 2012

[8] M/490 Smart Grid Mandate Standardization Mandate to European Standardisation Organisations (ESOs) to support European Smart Grid deployment, March 2013

[9] Functional reference architecture for communications in smart metering systems, CEN/CLC/ETSI/TR 50572, Dec. 2011

[10] The Smart Grid Architecture Model (SGAM) Framework, Nov 8, 2012, European Comission

[11] Smart Grid Reference Architecture, CEN-CENELEC-ETSI Smart Grid Coordination Group, November 2012

[12] SGCG/M490/G_Smart Grid Set of Standards, Version 3.1, October 31th 2014, CEN-CENELEC-ETSI Smart Grid Coordination Group