



IDIS (Interoperable Device Interface Specification)

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IDIS (Interoperable Device Interface Specification)

With the extension of smart metering to smart grids and smart homes, interoperability is fast becoming the crucial factor to secure investment. Landis+Gyr is proactively supporting international standardisation initiatives, thereby forming the basis for interoperable smart products. With the founding establishment of the Interoperable Device Interface Specification (IDIS) association, Landis+Gyr and other members commit themselves to the implementation of standards into interoperable solutions.

Introduction

The industry movement towards smart grids is evolving in phases. The first step, implementing smart metering, is taking place in many European countries, along with a movement from traditional electricity measurement to multi-energy metering. Development towards smart grids will also see smart metering expand into network management. Furthermore, smart metering is reaching consumers as personal energy management tools are bringing the power of energy optimisation into the home.

Technically, the building blocks for a smart grid are already available. **However, in order to achieve smart grid functionality, smart metering needs to be rolled out first.** Crucially, as smart metering expands to new markets, the industry must provide standards that enable true interoperability, not only for electricity but also for gas, heat/cold and water metering.

The drivers

The introduction of smart metering in Europe is driven by the introduction of the 3rd Energy package requiring that 80 percent of European households are equipped with smart meters by 2020. This will affect more than 200 million metering points. Initial estimations predict investments of more than 40 billion Euros into the deployment of smart metering by 2020.

Availability of smart metering functionality at each end point on the electricity distribution network provides

the technical means to gather a comprehensive set of data on the behaviour of the medium and low voltage distribution grid. Local smart meter interfaces to the final consumer offer the chance to manage local consumption and local electricity generation. In addition to the communication networks that are currently being established in order to connect metering points to utilities' IT infrastructure, the foundations are now being laid for total automation of the electricity distribution network – including local production and consumption. This type of upgrade towards a smart grid environment will require much higher levels of investment than the investments in smart metering. The financial justification for additional investment in smart grids depends in large part on the status of the grid infrastructure and on local conditions. Nevertheless, it is crucial that smart metering infrastructure supports the smooth upgrade to smart grids today or at a later date. This goal can only be achieved by providing interoperable interfaces – based on open, international standards – between the crucial components of the smart metering system.

The European commission has recognised the importance of interoperability based on open standards, and has issued mandate M/441 as a result.

Towards pan-European standardisation

That the EU commission mandates smart metering standardisation, as well as the market potential triggered by the 3rd energy package, has initiated many new projects within the European standardisation organisations. The newly established smart metering coordination group (comp. Fig. 1) ensures that there is no duplication of work between the different standardisation organisations, and that the challenging goals set by the EU commission can be met.

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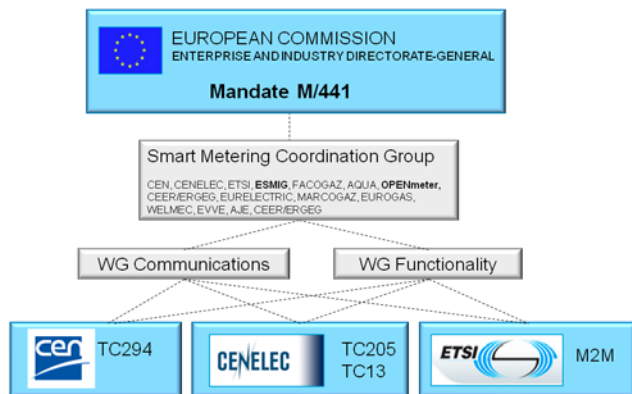


Figure 1: Implementation of the smart metering mandate M/441

The coordination group defined six “additional functionalities” which must be supported by European smart metering standards as a first priority:

1. Remote reading of metrological register(s) and provision to designated market organisation(s)
2. Two-way communication between the metering system and designated market organisation(s)
3. Support advanced tariffing and payment systems
4. Allow remote disablement and enablement of supply and flow/power limitations
5. Communicating with (and where appropriate directly controlling) individual devices within the home/building
6. Provide information via a portal/gateway to an in-home/building display or auxiliary equipment

There is clear emphasis on smart metering and smart home applications. The systemic benefits that are enabled by bi-directional exchange of measured energy data are many. **Most importantly, data availability is a pre-requisite to creating a smart grid environment – and data availability starts with smart metering.**

The Standardisation organisations only provide the framework and the process to ensure that the resulting

standards are truly open and that there are no hidden intellectual property rights (IPRs) attached to them. However, the actual standardisation work is performed by the members of the working groups. Key players contributing to the standardisation work are:

- ESMIG, the European Smart Metering Industry Group (www.esmig.eu), and
- The OPENmeter project (www.openmeter.com).

Within the scope of the OPENmeter project, major representatives of the European utilities, meter manufacturers and the communication technology industry develop the specifications and standards for smart metering.

From standards to interoperability

The mandate M/441 clearly states that the purpose of all standardisation activities is to achieve interoperability. Experience shows the following “shortcomings” of standards:

- there are typically several standards to choose from;
- within a specific standard there are usually different options to choose from (some standards even offer “manufacturer specific” extensions)

These “shortcomings” do not say anything about the quality of the standard but they instead reflect the actual situation in the market. Standards defining solutions for well established, mature markets normally allow fewer options, whereas standards for emerging and evolving markets must offer more options. Despite all these “shortcomings”, standards are an absolute necessity to achieve interoperability. Only standards issued by an official standardisation organisation (e.g. Cenelec, CEN, or IEC) offer the guarantee that all opinions were considered when defining the standard, that the standard is available for all and that there are no hidden IPRs attached to it. **The availability of open standards is a necessary condition to achieve interoperability – but it is not sufficient.**

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Interoperability can only be achieved with a commitment to a specific standard with a specific configuration of the options offered by the standard. In the European market there are two project examples where utilities have made this commitment to open standards. Landis+Gyr contributes know-how and key components to both projects:

- The LINKY project in France where ERDF committed the deployment (first phase 300'000 nodes in 2010) of smart meters according to the existing IEC standards (i.e. IEC 62056 for the smart metering applications and the application layer and IEC 61334 for the PLC communication). For this purpose ERDF has issued the LINKY companion specifications describing how these standards are used and which options are chosen. In addition, ERDF has also issued a specification for next generation PLC technology (G3), fitting into the existing standardisation framework and which may be considered for future upgrades, thereby ensuring backwards compatibility to the existing standards.

- The PRIME project launched by Iberdrola in Spain is based on the same upper and medium layer standards (IEC 62056, IEC61334) but uses the PRIME OFDM PLC technology on the physical layer. Also, PRIME technology is designed to fit into the existing standardisation framework and may be considered as a next generation PLC standard. Iberdrola has started the deployment of the first 100'000 meters conforming to these companion specifications.



Figure 3: Interoperable PRIME meter based on the evolving PRIME PLC-technology and standard IEC 62056 (DLMS/COSEM)

The examples above show that it is possible to achieve interoperability based on open standards provided that there is the necessary commitment from the utilities to investing in it. It must be noted that even though the companion specifications of the two projects differ, they are both based on the same standards. This makes it easier to attract a variety of manufacturers that can use many of their equipment parts in both projects and therefore profit from economies of scale.

The examples above illustrate that larger utilities have the resources required to commit to interoperability.



Figure 2: Interoperable LINKY equipment based on standards IEC 61334 (S-FSK PLC-technology) and IEC 62056 (DLMS/COSEM)

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But what about small and medium sized utilities? Do they have to accept the equipment optimised for one of the big ones?

In order to meet the requests of the smaller and medium sized utilities for interoperable equipment, a group of manufacturers have formed the IDIS (interoperable Device Interface Specification) association. The goal is to provide truly interoperable smart metering equipment.

The IDIS Association

In tomorrow's smart world, smart meters form the foundation of an interconnected system spanning from smart metering to smart grids and smart home applications. To secure the interoperability levels required to ensure a seamless flow of data and smooth upgrades for new applications, three smart metering industry leaders have founded the IDIS (Interoperable Device Interface Specifications) Industry Association in Zug, Switzerland, in order to make interoperability a reality in the smart metering industry.

The IDIS association develops, maintains and promotes publicly available technical interoperability specifications, known as 'IDIS specifications', based on open standards and supports their implementation in interoperable products. The association manages, administers and protects the IDIS quality label and supports rigorous interoperability testing to ensure high quality standards.

Considering the variety of technical smart metering standards currently available, commitment to developing interoperable products based on these standards is crucial. Standards guarantee open technology but they do not guarantee the availability of products which are tested for interoperability. Therefore, IDIS is committed to specifying how the existing and evolving standards are used in products and to providing the necessary testing environment required to achieve truly interoperable products. Further, IDIS members are committed to making interoperability

tested IDIS products available in the market.

With the establishment of the IDIS association, the founding members are stepping on virgin soil in the smart metering industry. However, the telecom industry has demonstrated that it is possible to achieve interoperability by following this path.

IDIS is an association for smart metering companies which are committed to providing interoperable products based on open standards. IDIS membership is open to any legal entity providing conformance tested IDIS equipment. Its current members include Iskraemeco, Itron and Landis+Gyr.

The specification team of the IDIS association is currently completing the detailed specifications for IDIS package 1 (based on secured S-FSK PLC communication according to IEC 61334-5-1 considering the latest extensions of the DLMS User Association), supporting the following smart metering use cases:

- Automatic meter registration and system integration
- Remote tariff programming
- On-demand and scheduled meter reading for electricity, gas, heat and water meters
- Disconnection and reconnection of electricity and gas supply
- System wide clock synchronisation
- Quality of supply supervision at end nodes of the distribution network
- Demand/load management
- Remote firmware update
- Restricted data access to authenticated users
- Secure data exchange by enciphering sensitive information and by authenticating the source of data

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In parallel, the IDIS team is developing the IDIS conformance test tool which automatically executes a comprehensive set of test cases to ensure the quality of interoperability on all levels. Only devices passing more than a thousand tests will be granted the IDIS interoperability label. The specification and the test tools are scheduled for release in the second half of 2010.

For more info: www.idis-association.com

Outlook

Besides driving international standardisation initiatives, Landis+Gyr is committed to implementing standards into interoperable products. With the founding of the IDIS Association, Landis+Gyr has established the required basis to provide “tested-interoperability” as a key feature of the Landis+Gyr Gridstream solution portfolio. Gridstream helps utilities maximise the effectiveness of their energy management assets through the seamless integration and flow of technology and information. Whether a utility needs the latest smart metering and network technology or personal energy management tools, Gridstream gives access to a complete range of advanced multi-energy products and systems.

A truly flexible solution, Gridstream can address all of energy needs in one complete energy management solution. Utilities may deploy individual Landis+Gyr products or components and integrate them into your existing infrastructure.

With the introduction of IDIS interfaces, integration of third party components into Gridstream becomes a plug-and-play exercise.



About Landis+Gyr

A trusted name in energy management solutions, Landis+Gyr operates in 30 countries across five continents. Landis+Gyr ranks as the worldwide leader in electricity metering with a preeminent position in Advanced Metering Management. Its meters and solutions empower utilities and end-customers to improve their energy efficiency, reduce their energy costs and contribute to a sustainable use of resources. With a proven track record for more than a century, it's Landis+Gyr's primary goal to help utilities manage energy better.

For more information on how you can manage energy better please contact:

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