IEC TS 62056-6-9

Edition 1.0 2016-05

TECHNICAL SPECIFICATION

colour inside

Electricity metering data exchange – The DLMS/COSEM suite – Part 6-9: Mapping between the Common Information Model message profiles (IEC 61968-9) and DLMS/COSEM (IEC 62056) data models and protocols

INTERNATIONAL ELECTROTECHNICAL COMMISSION

ICS 17.220.20; 35.100.01; 91.140.50

ISBN 978-2-8322-3328-3

CONTENTS

INTERNATIONAL ELECTROTECHNICAL COMMISSION

_____

ELECTRICITY METERING DATA EXCHANGE – THE DLMS/COSEM SUITE –

Part 6-9: Mapping between the Common Information Model message profiles (IEC 61968-9) and DLMS/COSEM (IEC 62056) data models and protocols

FOREWORD

1) The International Electrotechnical Commission (IEC) is a worldwide organization for standardization comprising all national electrotechnical committees (IEC National Committees). The object of IEC is to promote international co-operation on all questions concerning standardization in the electrical and electronic fields. To this end and in addition to other activities, IEC publishes International Standards, Technical Specifications, Technical Reports, Publicly Available Specifications (PAS) and Guides (hereafter referred to as "IEC Publication(s)"). Their preparation is entrusted to technical committees; any IEC National Committee interested in the subject dealt with may participate in this preparatory work. International, governmental and non-governmental organizations liaising with the IEC also participate in this preparation. IEC collaborates closely with the International Organization for Standardization (ISO) in accordance with conditions determined by agreement between the two organizations.
2) The formal decisions or agreements of IEC on technical matters express, as nearly as possible, an international consensus of opinion on the relevant subjects since each technical committee has representation from all interested IEC National Committees.
3) IEC Publications have the form of recommendations for international use and are accepted by IEC National Committees in that sense. While all reasonable efforts are made to ensure that the technical content of IEC Publications is accurate, IEC cannot be held responsible for the way in which they are used or for any misinterpretation by any end user.
4) In order to promote international uniformity, IEC National Committees undertake to apply IEC Publications transparently to the maximum extent possible in their national and regional publications. Any divergence between any IEC Publication and the corresponding national or regional publication shall be clearly indicated in the latter.
5) IEC itself does not provide any attestation of conformity. Independent certification bodies provide conformity assessment services and, in some areas, access to IEC marks of conformity. IEC is not responsible for any services carried out by independent certification bodies.
6) All users should ensure that they have the latest edition of this publication.
7) No liability shall attach to IEC or its directors, employees, servants or agents including individual experts and members of its technical committees and IEC National Committees for any personal injury, property damage or other damage of any nature whatsoever, whether direct or indirect, or for costs (including legal fees) and expenses arising out of the publication, use of, or reliance upon, this IEC Publication or any other IEC Publications.
8) Attention is drawn to the Normative references cited in this publication. Use of the referenced publications is indispensable for the correct application of this publication.
9) Attention is drawn to the possibility that some of the elements of this IEC Publication may be the subject of patent rights. IEC shall not be held responsible for identifying any or all such patent rights.

The main task of IEC technical committees is to prepare International Standards. In exceptional circumstances, a technical committee may propose the publication of a technical specification when

- the required support cannot be obtained for the publication of an International Standard, despite repeated efforts, or
- the subject is still under technical development or where, for any other reason, there is the future but no immediate possibility of an agreement on an International Standard.

Technical specifications are subject to review within three years of publication to decide whether they can be transformed into International Standards.

Technical specifications are subject to review within three years of publication to decide whether they can be transformed into International Standards.

IEC TS 62056-6-9, which is a technical specification, has been prepared by IEC technical committee 13: Electrical energy measurement and control:

The text of this technical specification is based on the following documents:

Enquiry draft	Report on voting
13/1647A/DTS	13/1672/RVC

Full information on the voting for the approval of this technical specification can be found in the report on voting indicated in the above table.

A list of all parts in the IEC 62056 series, published under the general title *Electricity metering data exchange – The DLSM/COSEM suite*, can be found on the IEC website.

This publication has been drafted in accordance with the ISO/IEC Directives, Part 2.

The committee has decided that the contents of this publication will remain unchanged until the stability date indicated on the IEC website under "http://webstore.iec.ch" in the data related to the specific publication. At this date, the publication will be

- transformed into an International standard,
- reconfirmed,
- withdrawn,
- replaced by a revised edition, or
- amended.

A bilingual version of this publication may be issued at a later date.

IMPORTANT – The 'colour inside' logo on the cover page of this publication indicates that it contains colours which are considered to be useful for the correct understanding of its contents. Users should therefore print this document using a colour printer.

INTRODUCTION

Smart grid, smart metering systems and advanced metering infrastructure are being developed and deployed worldwide in order to improve energy efficiency, better management of network assets, integrating distributed energy generation, involving customers in demand response and facilitating the operation of the deregulated energy market. Smart metering systems constitute an integral part of the smart grid. Therefore, it is important that a smooth and secure communication can be realized between ERP systems and metering end points.

IEC TC 57 develops CIM-based data models and protocols for information exchange for use in ERP integration and smart grid applications. In particular IEC 61968-9 deals with meter reading and control message profiles.

IEC TC 13 develops data models and protocols for information exchange for electrical energy measurement, and control equipment incorporating head end systems, end devices and intermediate data concentrator devices. In particular, the IEC 62056 series deals with the DLMS/COSEM data models and protocol suite.

This Technical Specification deals with the mapping between the CIM message profiles (IEC 61968-9) and DLMS/COSEM data models and protocols (IEC 62056).

In the following it is assumed that the mapping between CIM and DLMS/COSEM is performed in the metering HES. In the case where end-to-end security is established between a 3rd party CIM-based system and a DLMS/COSEM server, the mapping is performed in the 3rd party system.

ELECTRICITY METERING DATA EXCHANGE – THE DLMS/COSEM SUITE –

Part 6-9: Mapping between the Common Information Model message profiles (IEC 61968-9) and DLMS/COSEM (IEC 62056) data models and protocols

1 Scope

This part of IEC 62056, which is a Technical Specification, describes how in the utility environment an ERP system or a third party system can exchange information with a metering system. In particular, this Technical Specification covers the mapping between information interchange messages of a CIM-based ERP or third party system and a DLMS/COSEM-based metering system.

A typical metering system would comprise a HES and end devices such as meters as well as tariff and load control devices. There may be intermediate devices in the metering system such as NNAPs and LNAPs, as described in the smart metering architecture of IEC 62056-1-0. These intermediate devices are outside of the scope of this Technical Specification.

CIM ReadingType, EndDeviceControlType and EndDeviceEventType codes as specified in IEC 61968-9 are mapped to OBIS codes as specified in IEC 62056-6-1.

In some cases the CIM models and COSEM models are differently structured, in which case it is not possible to provide a one-to-one mapping between the OBIS codes and the CIM data type codes. In these cases the mapping is thus performed between the CIM UML object attributes and the COSEM object attributes (see 4.3.4 UC3).

CIM EndDeviceControlType codes as specified in IEC 61968-9 are mapped to COSEM IC attributes and methods as specified in IEC 62056-6-2.

CIM verbs and nouns as specified in IEC 61968-9 are mapped to DLMS service requests and responses as specified in IEC 62056-5-3.

Only the most commonly used UCs are given in order to illustrate possible applications. Extensions may be considered in future editions.

2 Normative references

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

IEC 60050-300, *International Electrotechnical Vocabulary (IEV) – Electrical and electronic measurements and measuring instruments – Part 311: General terms relating to measurements – Part 312: General terms relating to electrical measurements – Part 313: Types of electrical measuring instruments – Part 314: Specific terms according to the type of instrument*

IEC 61968-9:2013, *Application integration at electric utilities – System interfaces for distribution management – Part 9: Interface for meter reading and control*

IEC 61968-100:2013, *Application integration at electric utilities – System interfaces for distribution management – Part 100: Implementation profiles*

IEC 62056-5-3:2016, *Electricity metering data exchange – The DLMS/COSEM suite – Part 5-3: DLMS/COSEM application layer*

IEC 62056-6-1:2015, *Electricity metering data exchange - The DLMS/COSEM suite - Part 6-1: Object Identification System (OBIS)*

IEC 62056-6-2:2016, *Electricity metering data exchange - The DLMS/COSEM suite - Part 6-2: COSEM interface classes*