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Enterprise business function interfaces for utility operations – Part 9: Interfaces for meter reading and control

INTERNATIONAL
ELECTROTECHNICAL
COMMISSION

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IEC TC 57 : POWER SYSTEMS MANAGEMENT AND ASSOCIATED INFORMATION EXCHANGE

SECRETARIAT:	SECRETARY:
Germany	Mr Heiko Englert
OF INTEREST TO THE FOLLOWING COMMITTEES:	HORIZONTAL STANDARD:
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FUNCTIONS CONCERNED:

☐ EMC ☐ ENVIRONMENT ☐ QUALITY ASSURANCE ☐ SAFETY

☒ SUBMITTED FOR CENELEC PARALLEL VOTING	☐ NOT SUBMITTED FOR CENELEC PARALLEL VOTING
Attention IEC-CENELEC parallel voting The attention of IEC National Committees, members of CENELEC, is drawn to the fact that this Final Draft International Standard (FDIS) is submitted for parallel voting. The CENELEC members are invited to vote through the CENELEC online voting system.	

TITLE:

Enterprise business function interfaces for utility operations – Part 9: Interfaces for meter reading and control

PROPOSED STABILITY DATE: 2025

NOTE FROM TC/SC OFFICERS:

IMPORTANT – Please note the generic title of the series IEC 61968 has been changed from 'Application integration at electric utilities - System interfaces for distribution management' to read 'Enterprise business function interfaces for utility operations' (refers to 57/2097/Q circulated on 2019-05-24 which was approved)

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

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ENTERPRISE BUSINESS FUNCTION INTERFACES FOR UTILITY OPERATIONS –

Part 9: Interfaces for meter reading and control

FOREWORD

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IEC 61968-9 has been prepared by IEC technical committee 57: Power systems management and associated information exchange. It is an International Standard.

This third edition cancels and replaces the second edition published in 2013. This edition constitutes a technical revision.

This edition includes the following significant technical changes with respect to the previous edition:

a) IEC 61968-100:2022 has superseded IEC 61968-100:2013 that was used in many of the examples in IEC 61968-9:2013. Applicable portions of the current version of IEC 61968-9 have been updated to reflect message envelope and message exchange patterns specified in IEC 61968-100:2022. Although the use of IEC 61968-100 is highly recommended, it is possible to utilize IEC 61968-9 without using IEC 61968-100 message envelopes or exchange patterns. This was true for IEC 61968-9:2013 and remains true for this IEC 61968-9:2024.

b) Unless noted otherwise, the IEC 61968-9:2013 XSDs that remain in IEC 61968-9:2024 are unchanged except for changes that have been made for compatibility with IEC 61968-100:2022 as described in 61968-100:2022. This supports the abstract payload construct in the Message.xsd defined in IEC 61968-100:2022. As a result, these modified profiles have a new namespace. One notable exception is that the MeterReadSchedule.xsd has been replaced with a new MeterReadSchedules.xsd. It has structural changes to support improved functionality as described in 5.3.3. Another exception is that the GetMeterReadSchedule.xsd has been replaced with GetMeterReadSchedules.xsd. Also note that IEC 61968-8:2015 profiles listed in the table in Annex A will require edits in order to be compatible with IEC 61968-100:2022.

c) The "Verbs" listed in IEC 61968-9:2013, Annex A have been moved to IEC 61968-100:2022. Annex A now (in this third edition) instead provides a table which recommends the use of certain verbs to accompany profiles related to 61968-9;

d) The "Reply Error Codes" listed in IEC 61968:2013, Annex B have been moved to IEC 61968-100:2022. Annex B now (in this third edition) instead provides a few recommendations on how to handle certain error situations which might originate in 61968-9;

e) Customer profiles CustomerAccountConfig, CustomerAgreementConfig, CustomerConfig, GetAuxiliaryAgreementConfig, GetCustomerAccountConfig, GetCustomerAgreementConfig, GetServiceCategoryConfig, GetCustomerConfig, GetMeterServiceRequests, GetPricingStructureConfig, GetServiceLocationConfig, GetServiceSupplierConfig, MeterServiceRequests, PricingStructureConfig, ServiceCategoryConfig, ServiceLocationConfig, and ServiceSupplierConfig have been deleted from this document and moved to IEC 61968-8. However, certain references to these profiles have been retained for the sake of usability. A "MeterServiceRequest" which might by issued by a function within IEC 61968-9:2013, is now shared with 61968-8 which also could just as well have a need to issue such a request. Users of one part may have to refer to another part within the 61968 series in order to obtain a shared schema. Furthermore, certain names may change when they are moved from one part to another. For example, a "MeterServiceRequest" is now referred to as a (more generic) "ServiceRequest".;

f) Additional enumerations have been provided in the annexes for ReadingTypes (Annex C), EndDeviceEventTypes (Annex E) and EndDeviceControlTypes (Annex F);

g) Statements have been added to certain figures, tables, schemas, and enumerations throughout the document that indicate that they are reproduced with the permission of the UCA International User Group (UCAIug). These items are derived from the Common Information Model (CIM);

h) The "Conventions for naming and identifying objects" provided in IEC 61968:2013, Annex G has been deleted. The user should instead consider IEC 61968-11, *Common information model (CIM) extensions for Operation Support* or IEC 61970-301, *Energy management system application program interface (EMS-API) – Part 301: Common information model (CIM) base*. This deletion causes subsequent Annexes in IEC 61968:2013, to be renumbered in this third edition;The "Notes on extended use of IEC 61968-100" provided in Annex M of IEC 61968:2013, have been deleted. It is recommended that the reader instead obtain a copy of the most recent version of 61968-100.

i) The profiles in IEC 61968-9:2013, Annex H "(Normative) XML Schemas for Message Payloads" and IEC 61968-9:2013, Annex I "(Informative) XML Schemas for Message Payloads" have been removed from the document. Instead, there is now (in this third edition) an Annex G which provides links to the profiles at the UCAIug website,

j) Small changes have been made to the document for better comprehension and usability;

k) Added normative and informative annexes (K,L, and M) to describe how IEC 61968-9 can be used to support European regulation regarding access to data and interoperability. In particular, these annexes describe the EUMED Metering profile, and serve to draft requirements to address provisions laid down in Articles 20, 23, and 24 of the Electricity Directive (EU) 2019/944. For more information refer to IEC 62325-451-10.

The text of this International Standard is based on the following documents:

Draft	Report on voting
57/XX/FDIS	57/XX/RVD

Full information on the voting for its approval can be found in the report on voting indicated in the above table.

The language used for the development of this International Standard is English.

This document was drafted in accordance with ISO/IEC Directives, Part 2, and developed in accordance with ISO/IEC Directives, Part 1 and ISO/IEC Directives, IEC Supplement, available at www.iec.ch/members_experts/refdocs. The main document types developed by IEC are described in greater detail at www.iec.ch/publications.

A list of all parts in the IEC 61968 series, published under the general title *Enterprise business function interfaces for utility operations*, can be found on the IEC website.

Future standards in this series will carry the new general title as cited above. Titles of existing standards in this series will be updated at the time of the next edition.

This IEC standard includes Code Components i.e. components that are intended to be directly processed by a computer. Such content is any text found between the markers <CODE BEGINS> and <CODE ENDS>, or otherwise is clearly labelled in this standard as a Code Component.

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

- reconfirmed,
- withdrawn, or
- revised.

IMPORTANT – The "colour inside" logo on the cover page of this document 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

The purpose of this part of IEC 61968 is to define a standard for the integration of Metering Systems (MS), which would include traditional (one or two-way) Automated Meter Reading (AMR) Systems, with other systems and business functions within the scope of IEC 61968. The scope of this document is the exchange of meter reading, transactions, event and control information between systems within the utility enterprise and between enterprises. The specific details of communication protocols those systems employ are outside the scope of this document. Instead, this document will recognize and model the general capabilities that can be potentially provided by advanced and/or legacy meter infrastructures, including two-way communication capabilities such as load control, dynamic pricing, outage detection, distributed energy resource (DER) control signals and on-request read.

ENTERPRISE BUSINESS FUNCTION INTERFACES FOR UTILITY OPERATIONS –

Part 9: Interfaces for meter reading and control

1 Scope

This part of IEC 61968 specifies the information content of a set of message types that can be used to support many of the business functions related to meter reading and control. Typical uses of the message types include meter reading, controls, events, customer data synchronization and customer switching. Although intended primarily for electrical distribution networks, IEC 61968-9 can be used for other metering applications, including non-electrical metered quantities necessary to support gas and water networks.

The purpose of this document is to define a standard for the integration of metering systems (MS), which includes traditional manual systems, and (one or two-way) automated meter reading (AMR) systems, and meter data management (MDM) systems with other enterprise systems and business functions within the scope of IEC 61968. The scope of this document is the exchange of information between metering systems, MDM systems and other systems within the utility enterprise. The specific details of communication protocols those systems employ are outside the scope of this document. Instead, this document will recognize and model the general capabilities that can be potentially provided by advanced and/or legacy meter infrastructures, including two-way communication capabilities such as load control, dynamic pricing, outage detection, distributed energy resource (DER) control signals and on-request read. In this way, this document will not be impacted by the specification, development and/or deployment of next generation meter infrastructures either through the use of standards or proprietary means.

Figure 1 describes the scope of this document from the perspective of direct and causal or indirect impacts of IEC 61968-9 messages. Where the focus of IEC 61968-9 is to define standard messages for the integration of enterprise applications, these messages may be directly or indirectly related to information flows within a broader scope. Examples would include messaging between head end systems and meters or PAN devices. The various components described later in this document will typically fall into either the category of a metering system (MS) head end, an MDM or other enterprise application (e.g. OMS, DRMS, CIS).

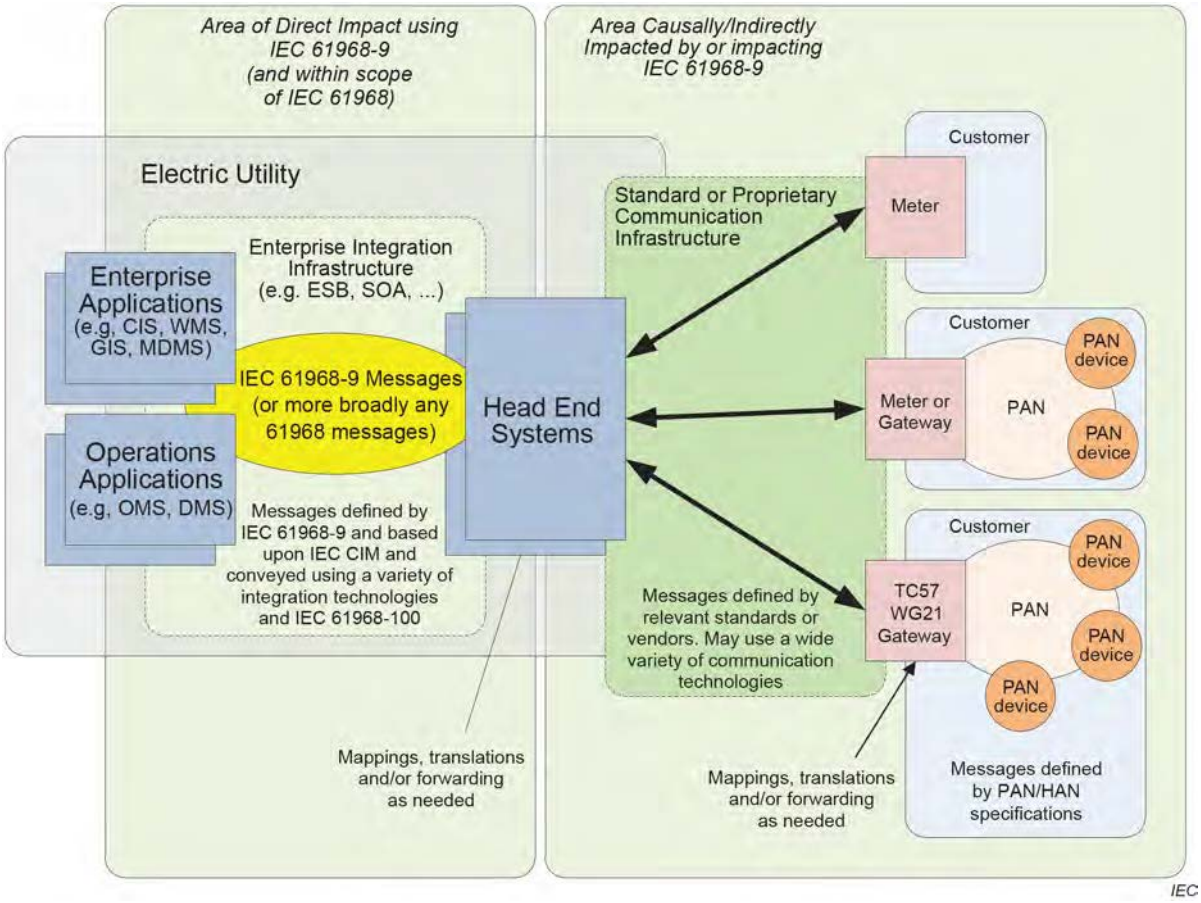

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Figure 1 – IEC 61968-9 scope

The capabilities and information provided by a meter reading and meter data management systems are important for a variety of purposes, including (but not limited to) interval data, time-based demand data, time-based energy data (usage and production), outage management, service interruption, service restoration, quality of service monitoring, distribution network analysis, distribution planning, demand response, customer billing and work management. This standard also extends the CIM (Common Information Model) to support the exchange of meter data.

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

IEC 60050-112, *International Electrotechnical Vocabulary (IEV) – Part 112: Quantities and units*

IEC 60050-300, *International Electrotechnical Vocabulary (IEV) – Part 300: 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 61968-1, *Application integration at electric utilities – System interfaces for distribution management – Part 1: Interface architecture and general recommendations*

IEC TS 61968-2, *Application integration at electric utilities – System interfaces for distribution management – Part 2: Glossary*

IEC 61968-8:2015, *Application integration at electric utilities – System interfaces for distribution management – Part 8: Interfaces for customer operations*

IEC 61968-11, *Application integration at electric utilities – System interfaces for distribution management – Part 11: Common information model (CIM) extensions for distribution*

IEC 61968-100:2022, *Application integration at electric utilities – System interfaces for distribution management – Part 100: IEC implementation profiles for application integration*

IEC 61970-301, *Energy management system application program interface (EMS-API) – Part 301: Common information model (CIM) base*

IEC TR 62051-1, *Electricity metering – Data exchange for meter reading, tariff and load control – Glossary of terms – Part 1: Terms related to data exchange with metering equipment using DLMS/COSEM*

ISO 4217:2015, *Codes for the representation of currencies*

ISO 8601:2004, *Data Elements and Interchange Formats – Information Interchange – Representation of Dates and Times*

CIM Meter Reading and Control Profile Messages, Edition 3, available at https://cimug.ucaiug.org