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IEC 61968-9

Edition 1.0 2009-09

INTERNATIONAL STANDARD

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Application integration at electric utilities – System interfaces for distribution management – Part 9: Interfaces for meter reading and control

INTERNATIONAL ELECTROTECHNICAL COMMISSION

PRICE CODE XH

ICS 33.200

ISBN 978-2-88910-592-2

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

APPLICATION INTEGRATION AT ELECTRIC UTILITIES – SYSTEM INTERFACES FOR DISTRIBUTION MANAGEMENT –

Part 9: Interfaces for meter reading and control

FOREWORD

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

The text of this standard is based on the following documents:

FDIS	Report on voting
57/1009/FDIS	57/1020/RVD

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

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

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A list of all parts in IEC 61968 series, under the general title: *Application integration at electric utilities – System interfaces for distribution management*, can be found on the IEC website.

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

- reconfirmed,
- withdrawn,
- replaced by a revised edition, or
- amended.

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

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INTRODUCTION

The purpose of this document 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 standard is the exchange of information between a metering system and other systems within the utility enterprise. The specific details of communication protocols those systems employ are outside the scope of this standard. Instead, this standard 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 standard 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.

The IEC 61968 series of standards is intended to facilitate inter-application integration as opposed to intra-application integration. Intra-application integration is aimed at programs in the same application system, usually communicating with each other using middleware that is embedded in their underlying runtime environment, and tends to be optimized for close, real-time, synchronous connections and interactive request/reply or conversation communication models. Therefore, these interface standards are relevant to loosely coupled applications with more heterogeneity in languages, operating systems, protocols and management tools. This series of standards is intended to support applications that need to exchange data every few seconds, minutes, or hours rather than waiting for a nightly batch run. This series of standards, which are intended to be implemented with middleware services that exchange messages among applications, will complement, not replace utility data warehouses, database gateways, and operational stores.

As used in IEC 61968, a distribution management system (DMS) consists of various distributed application components for the utility to manage electrical distribution networks. These capabilities include monitoring and control of equipment for power delivery, management processes to ensure system reliability, voltage management, demand-side management, outage management, work management, automated mapping and facilities management. Standard interfaces are defined for each class of applications identified in the interface reference model (IRM), which is described in IEC 61968-1: System interfaces for distribution management – Part 1: Interface architecture and general requirements.

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This part of IEC 61968 contains the clauses listed below.

Document overview for IEC 61968-9

Clause/Annex	Title	Purpose
1	Scope	The scope and purpose of the document are described
2	Normative references	Documents that contain provisions which, through reference in this text, constitute provisions of this International Standard
3	Terms, definitions and abbreviations	Provides terms, definitions and abbreviations
4	Reference and information models	Description of general approach to metering system, reference model, use cases, interface reference model, meter reading and control functions and components, message type terms and static information model
5	Meter reading and control message types	Message types related to the exchange of information for documents related to meter reading and control
Annex A	Description of message type verbs	Description of the verbs that are used for the message types
Annex B	Recommended message structure	CIM extensions to support the recommended message structure for meter reading and control
Annex C	Recommended procedure for the generation of a ReadingType	Recommended technique for constructing, and offers sample enumerations for the ReadingTypeId textual name and mRID
Annex D	Recommended Quality code enumerations	Recommends technique for constructing, and offers sample enumerations for reading quality codes
Annex E	Recommended EndDeviceEvent category enumerations	Recommends EndDeviceEvent alarm codes
Annex F	Recommended EndDeviceControl code enumerations	Describes recommended technique for leveraging EndDeviceEvent codes to create EndDeviceControl codes
Annex G	Recommended procedure for maintaining relationships between objects	To describe the use of the master resource identifier (mRID)
Annex H	XML schemas for message payloads	To provide xsd information for use by developers to create IEC 61968-9 messages
Annex I	Mappings to ebIX	To provide mappings between IEC 61968-9 meter readings and ebIX.
Annex J	Request parameters	Describes the qualification of GET requests using request parameters

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APPLICATION INTEGRATION AT ELECTRIC UTILITIES – SYSTEM INTERFACES FOR DISTRIBUTION MANAGEMENT –

Part 9: Interfaces for meter reading and control

1 Scope

This document is Part 9 of the IEC 61968 standard and 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, meter control, meter 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, with other systems and business functions within the scope of IEC 61968. The scope of this International Standard is the exchange of information between a metering system and other systems within the utility enterprise. The specific details of communication protocols those systems employ are outside the scope of this standard. Instead, this standard 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 standard 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.

The capabilities and information provided by a meter reading system 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 reduction, 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 referenced documents are indispensable for the application 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 60050-300, *International Electrotechnical Vocabulary – 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 requirements*

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

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IEC 61968-3, *Application integration at electric utilities – System interfaces for distribution management – Part 3: Interface for network operations*

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

IEC 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*

IEC 62055-31, *Electricity metering – Payment systems – Part 31: Particular requirements – Static payment meters for active energy (classes 1 and 2)*

IEC 62056 (all parts), *Electricity metering – Data exchange for meter reading, tariff and load control*

ISO 4217, *Codes for the representation of currencies and funds*

ISO 8601:2004, *Data elements and interchange formats – Information interchange – Representation of dates and times*

ANSI C12.19, *Utility Industry End Device Data Tables*

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