IEC 61968-4

Edition 2.0 2019-03

INTERNATIONAL STANDARD

NORME INTERNATIONALE

colour inside

Application integration at electric utilities – System interfaces for distribution management –
Part 4: Interfaces for records and asset management

Intégration d'applications pour les services électriques – Interfaces système pour la gestion de la distribution –
Partie 4: Interfaces pour la gestion des dossiers et des actifs

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

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

Part 4: Interfaces for records and asset management

FOREWORD

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

This second edition cancels and replaces the first edition published in 2007. This edition constitutes a technical revision.

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

a) removal of edition 1 profiles whose functionality has been superseded by other parts of IEC 61970 and IEC 61968 standards. In particular, NetworkDataSet and ChangeSet have been superseded by standards such as CDPSM (IEC 61968-13) and other ongoing efforts such as change modelling; and Presentation has been superseded by Diagram Layout Profile (IEC 61970-453);
b) revision of the edition 1 profiles AssetList, AssetCatalogue and TypeAssetCatalogue to realign with current use cases and the latest CIM UML release. These profiles are based

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on an old version of CIM UML and many of the classes in these profiles are no longer in the recent CIM UMLs;

c) addition of several new profiles to enable the exchange of asset condition data, analytics results and alerts, assets' physical, functional and lifecycle details, and assets' work;

d) informative annexes on how this document can be used to enable strategic asset management;

e) informative annexes with illustrative examples for the application of this document;

f) scope coordinated with IEC 61968-13 where applicable;

g) use cases in IEC 62559-2 use case template;

h) traceability of use cases to IEC 62913-2-1 use cases.

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

FDIS	Report on voting
57/2059/FDIS	57/2074/RVD

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

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

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

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

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INTRODUCTION

The IEC 61968 standard series, taken as a whole, defines interfaces for the major elements of an interface architecture for Distribution Management Systems (DMS). IEC 61968-1, *Interface architecture and general recommendations*, identifies and establishes requirements for standard interfaces based on an Interface Reference Model (IRM). IEC 61968-3 to -9 define interfaces relevant to each of the major business functions described by the Interface Reference Model.

As used in IEC 61968, a 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.

This series of standards is limited to the definition of interfaces and is implementation independent. They provide for interoperability among different computer systems, platforms, and languages. Methods and technologies used to implement functionality conforming to these interfaces are considered outside of the scope of these standards; only the interface itself is specified in these standards.

The purpose of this part of IEC 61968 is to define a standard for the integration of Records and Asset Management (AM), which would include Geographic Information Systems and Asset Risk Management Systems, with other systems and business functions within the scope of IEC 61968. The scope of this document is the exchange of information between Records and Asset Management 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 records and asset management systems including asset risk assessment, asset planning, and condition-based asset management. In this way, this document will not be impacted by the specification, development and/or deployment of next generation records and asset management systems, 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 optimised for close, real-time, synchronous connections and interactive request/reply or conversation communication models. IEC 61968, by contrast, is intended to support the inter-application integration of a utility enterprise that needs to connect disparate applications that are already built or new (legacy or purchased applications), each supported by dissimilar runtime environments. 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.

This part of IEC 61968 contains the clauses listed in Table 1.

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Table 1 – Document overview for IEC 61968-4

Clause	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 and definitions	Description of concepts and terms pertinent to records and asset management.
4	Reference and information models	Description of general approach to records and asset management systems, reference model, use cases, interface reference model, records and asset management functions and components, message type terms and static information model.
5	Records and asset management message types	Message types related to the exchange of information for documents related to records and asset management.
Annex A	Description of message type verbs	Description of the verbs that are used for the message types.
Annex B	Use cases	Description of use cases pertaining to this standard.
Annex C	Asset management	Description of an example asset management framework that leverages this standard.
Annex D	Asset models and information exchange – The case for formal instance templates	Description of the use of CIM to model typical electrical power utility assets.
Annex E	Asset Models and information exchange	Illustration of asset related messages and typical information exchanges.
Annex F	Asset measurements models and information exchange	Illustration of asset measurements related messages and typical information exchanges.
Annex G	Analytics models and information exchange	Illustration of asset analytics related messages and typical information exchanges.

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Part 4: Interfaces for records and asset management

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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 records and asset management. Typical uses of the message types defined in this document include network extension planning, copying feeder or other network data between systems, network or diagram edits and asset inspection. Message types defined in other parts of IEC 61968 may also be relevant to these use cases.

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 61968-1:2012, *Application integration at electric utilities – System interfaces for distribution management – Part 1: Interface architecture and general recommendations*

IEC 61968-3:2017, *Application integration at electric utilities – System interfaces for distribution management – Part 3: Interface for network operations*

IEC 61968-6:2015, *Application integration at electric utilities – System interfaces for distribution management – Part 6: Interfaces for maintenance and construction*

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

IEC 61968-11:2018, *Application integration at electric utilities – System interfaces for distribution management – Part 11: Common information model (CIM) extensions for distribution*

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

IEC 61970-301:2016, *Energy management system application program interface (EMS-API) – Part 301: Common information model (CIM) base*

IEC 62361-100:2016, *Power systems management and associated information exchange – Interoperability in the long term – Part 100: CIM profiles to XML schema mapping*

IEC TR 62361-103:2018, *Power systems management and associated information exchange – Interoperability in the long term – Part 103: Standard profiling*

ISO 55000:2014, *Asset management – Overview, principles and terminology*

ISO 55001:2014, *Asset management – Management systems – Requirements*

ISO 55002:2014, *Asset management – Management systems – Guidelines for the application of ISO 55001*

3 Terms and definitions

No terms and definitions are listed in this document.

ISO and IEC maintain terminological databases for use in standardization at the following addresses:

- IEC Electropedia: available at http://www.electropedia.org/
- ISO Online browsing platform: available at http://www.iso.org/obp

4 Reference and information models

4.1 General

The message types defined in this document are based on a logical partitioning of the utility enterprise business functions and components called the IEC 61968 Interface Reference Model. The contents of the message types are based on a static information model to ensure consistency of field names and data types. Each message type is defined as a set of fields copied from the information model classes in IEC 61968-11 and IEC 61970-301. This message definition is performed in accordance with IEC 62361-100 and IEC 62361-103. In particular, starting from the canonical model as described in IEC 61968-11 and IEC 61970-301, the contextual model is defined, and the profile/syntactic model is generated in the form of XSD schema.

The message types defined in this document are intended to satisfy a majority of typical applications. In some particular project implementations, it may be desirable to modify the set of fields using a methodology such as that described in IEC 61968-1.

4.2 Reference model

4.2.1 General

The diagrams shown in Figure 1 through Figure 3 serve as reference model and provide example of the logical components and data flows related to this document. The said diagrams describe the flows between the components in the reference model. The numbers in brackets provide linkages to the flow definitions. The reference architecture reflects several main logical components (potentially realized as systems or subsystems) that are part of records and asset management or are related to it through the need to exchange information. The logical components illustrated are:

a) Network Operation Monitoring (NMON)

b) Asset Monitoring and Measurement (AMM)

c) Asset Decision Support (ADS)

d) Substation and Network Inventory (EINV)

e) Geographical Inventory (GINV)

f) Maintenance and Inspection (MAI)

g) Work Scheduling and Dispatching (SCHD)

The data flows are split into three diagrams, each one depicting the data flow pertaining to a major area of this document. Figure 1 shows the data flows pertaining to Assets, such as their lifecycle information, location, ownership, nameplate information, and model information. Figure 2 shows the data flows pertaining to Measurements, such as procedures performed on assets or measurements made on them, and the corresponding datasets and measurement

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