IEC 63402-1

Edition 1.0 2025-06

INTERNATIONAL STANDARD

NORME INTERNATIONALE

GROUP ENERGY EFFICIENCY PUBLICATION
PUBLICATION GROUPÉE SUR L'EFFICACITÉ ÉNERGÉTIQUE

Energy efficiency - Customer energy management systems - Part 1: General requirements and architecture

Efficacité énergétique - Système de gestion d'énergie client - Partie 1: Exigences générales et architecture

ICS 03.100.70, 27.015, 29.020

ISBN 978-2-8327-0498-1

IEC 63402-1:2025-06(en-fr)

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

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Energy efficiency - Customer energy management systems - Part 1: General requirements and architecture

FOREWORD

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IEC 63402-1 has been prepared by subcommittee 23K: Electrical energy efficiency products, of IEC technical committee 23: Electrical accessories. It is an International Standard.

It has the status of a group energy efficiency publication in accordance with IEC Guide 118.

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

Draft	Report on voting
23K/120/FDIS	23K/126/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 63402 series, published under the general title *Energy efficiency – Customer energy management systems*, can be found on the IEC website.

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- withdrawn, or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.

INTRODUCTION

In traditional electricity networks, energy flows in one direction and communications from the generator to the consumer is generally done via the transmission and distribution systems.

Although there is some monitoring and control of equipment in the transmission and distribution systems, there is no communication with, or control of, consumer equipment. In particular, there is no means of requesting short-term control of consumer equipment to match either the prevailing generation, or transmission and distribution grid conditions, or both. Generation equipment is controlled to match the open-ended (uncontrolled) demand of the consumer.

Today the world is faced with an increase of energy consumption, which is directly linked to an increase of CO_2 production. The increased CO_2 density in the atmosphere supports the climate warming of the earth.

One significant way to cope with the increased energy consumption without increasing the CO_2 production is to use more renewable energy resources.

Unfortunately, the available renewable energy supply is not aligned with the energy demand. To increase efficiency, the energy demand should be aligned as much as possible with the available energy supply. The future grid will become generation led rather than demand led as it is today. In order to reach this goal, communications between the various equipment and systems of the stakeholders within the energy field is necessary. This new form of grid which exchanges information and energy between producers, consumers, distributors and metering is known as the "Smart Grid".

The IEC 63402 series describes aspects of this Smart Grid that relate specifically to the premises (home or building) part of the Smart Grid, including the common interface between equipment in the premises and the Smart Grid.

1 Scope

This part of IEC 63402 specifies general requirements and the architecture between the Point of Common Coupling (PCC) and smart devices (SD) operating within the Smart Grid premises-side system (i.e. residential or commercial but not industrial premises).

This document does not include requirements for:

– safety

– electromagnetic compatibility (EMC);

– data security, as it is assumed that the underlying protocols will take the data security aspect into account

NOTE Although data security is not within the scope of this document, Clause 4 provides some high level design guidelines for data security.

– special equipment (e.g. legacy heat pumps) with a direct physical connection to the grid, as such equipment bypasses the customer energy manager (CEM) and is not HBES/BACS enabled (covered by other standards than the IEC 63402 series).

This group EE publication is primarily intended to be used as an EE standard for the products mentioned in the scope, but is also intended to be used by TCs in the preparation of publications for products which are included in the boundary mentioned in the scope of this document.

2 Normative references

There are no normative references in this document.

3 Terms, definitions and abbreviated terms

For the purposes of this document, the following terms, definitions and abbreviated terms apply.

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

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

3.1 Terms and definitions

3.1.1
Customer Energy Manager
CEM
internal automation function for optimizing the energy consumption, production and storage within the premises according to the preferences of the customer using internal flexibilities and typically based on external information received through the Energy Management Gateway and possibly other data sources

3.1.2
Customer Energy Manager system
CEM system
system that allows the management of energy consumption, production and storage within the premises, consisting of a CEM connected to one or more resource managers (RMs) which themselves act as gateways to HBES/BACS, either SASS or smart appliances, or both

Note 1 to entry: In other standards this is often referred to as an Energy Management Systems (EMS).