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Electrical and electronic household and office equipment - Measurement of networked standby power of edge equipment

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CONTENTS

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Electrical and electronic household and office equipment – Measurement of networked standby power of edge equipment

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IEC 63474 has been prepared by IEC technical committee 100: Audio, video and multimedia systems and equipment and IEC technical committee 59: Performance of household and similar electrical appliances. It is an International Standard.

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

This second edition cancels and replaces the first edition published in 2023. This edition constitutes a technical revision.

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

a) the scope and the measurement method were extended to battery operated products;
b) terms and definitions, and measurement conditions have been updated and aligned for both IEC 62301 (ED3) and this document, IEC 63474 (ED2).

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

Draft	Report on voting
100/4461/FDIS	100/4481/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/standardsdev/publications.

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– withdrawn, or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

The methods specified in this document are intended to define requirements for the measurement of power used by equipment having one or more wired or wireless network port(s) in those modes that are able to resume a function by way of a remotely initiated trigger or reactivation trigger from a network connection (networked standby mode).

For the measurement of power used in non-active mode other than networked standby mode,, reference is made to IEC 62301 [1].

This document also provides a method to test power management and to test whether it is possible to deactivate wireless network connection(s).

IEC 63474:2023 [2] (ED1) was based on EN 50643:2018 [3]. It was submitted to the National Committees for voting under the Fast Track Procedure.

1 Scope

This document specifies methods of measurement of electrical power in networked standby mode and the reporting of the results for edge equipment.

The measurement of power and energy use in non-active mode, other than networked standby mode, is covered by IEC 62301 [1], including the input voltage range.

This document applies to edge equipment that is powered by:

– low voltage mains AC power (LV ≤ 1 000 V AC), or
– an external power supply that provides low voltage (LV ≤ 1 000 V) or extra low voltage (ELV ≤ 50 V) AC or DC power, or
– a separate source of extra low voltage DC power (ELV ≤ 50 V DC), or
– an internal main battery.

Conditions that are outside the scope of this document are as follows:

– active modes (primary function),
– other non-active modes (which are either covered by IEC 62301 [1] or by specific product group standards),
– conditions where main batteries are being charged other than in maintenance mode,
– disconnected condition of the equipment.

This document applies to the following product groups where a networked standby mode is present:

– edge equipment with a network reactivation function, such as household appliances, information technology equipment, audio, video and multimedia systems and equipment,
– digital radio receivers with an emergency warning function,
– gas burning equipment with electrical components.

NOTE 1 The measurements of power, energy use and performance of products during their intended use (when performing their primary functions) are generally specified in product standards and are not covered by this document.

NOTE 2 Networked standby mode for lighting equipment and the measurement of power is specified in IEC 63103 [4].

NOTE 3 Interconnecting equipment (equipment that provides network infrastructure and function) is outside the scope of this document. Measurement of electrical power in networked standby mode for interconnecting equipment is the subject of ETSI standard EN 303 423 [5].

This document also provides a method to test power management and to test whether it is possible to deactivate wireless network connection(s).

NOTE 4 Edge equipment can also include auxiliary batteries.

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

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 62104, *Characteristics of DAB receivers*

IEC 62301, *Household electrical appliances - Measurement of standby power*

3 Terms, definitions and abbreviated terms

3.1 Terms and definitions

For the purposes of this document, the terms and definitions given in IEC 62301 as well as the following apply.

NOTE Annex A shows the conceptual framework of power modes and functions.

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

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

3.1.1 Function related terms and definitions

3.1.1.1
function
<of a product> predetermined operation undertaken by a product

Note 1 to entry: Functions can be controlled by an interaction of the user, of other technical systems, and of the system itself, from measurable inputs from the environment and/or time.

Note 2 to entry: A function can be classified as primary function (3.1.1.2), secondary function (3.1.1.3) or tertiary function (3.1.1.4), which are broad categories. The specific categorization of a function can be determined for each type of equipment.

3.1.1.2
primary function
<of a product> function (3.1.1.1) providing a main intended purpose

EXAMPLE Cleaning of clothes by a washing machine, displaying of video or providing sound by a television.

Note 1 to entry: Products can have more than one primary function.

Note 2 to entry: Figure A.1 provides a structured overview as an aid to understanding functional relationships and energy use applicable in electrotechnical products. Additional terms and definitions to fulfil the particular needs of product sectors should be defined within the structure of the concepts shown in Figure A.1.

[SOURCE: IEC 60050-904:2014 [6], 904-03-02, modified - Subject field added, the word ‘main’ added to the definition, Example and new Note 1 to entry added, existing Note 1 to entry becomes Note 2 to entry, reference to Table 1 replaced by reference to Figure A.1 in Note 2 to entry, and the table is omitted from this term entry.]

3.1.1.3
secondary function
<of a product> function (3.1.1.1) that enables, supplements or enhances a primary function (3.1.1.2)

EXAMPLE 1 Secondary functions can include status information functions, network (3.1.3.1) integrity functions, reactivation functions, or sensor-based functions.

EXAMPLE 2 Timer informing of the remaining time for completion of the washing program or the delay start function (3.1.1.1) of a washing machine.

Note 1 to entry: Figure A.1 provides a structured overview as an aid to understanding functional relationships and energy use applicable in electrotechnical products. Additional terms and definitions to fulfil the particular needs of product sectors should be defined within the structure of the concepts shown in Figure A.1.

[SOURCE: IEC 60050-904:2014 [6], 904-03-03, modified - Subject field added, Examples added, in Note 1 to entry 'Table 1' replaced by 'Figure A.1', and the table is omitted from this term entry.]

3.1.1.4
tertiary function
<of a product> function (3.1.1.1) other than a primary or a secondary function (3.1.1.3)

EXAMPLE 1 An electromagnetic compatibility (EMC) filter, if present, can provide its function (3.1.1.1) in non-active mode (3.1.2.3) and active mode (3.1.2.2).

EXAMPLE 2 Event and failure data recorder in a washing machine for service and design improvement purposes.

Note 1 to entry: Primary functions, secondary functions and tertiary functions are not distinguished by whether they are necessary or non-necessary.

Note 2 to entry: Figure A.1 provides a structured overview as an aid to understanding functional relationships and energy use applicable in electrotechnical products. Additional terms and definitions to fulfil the particular needs of product sectors should be defined within the structure of the concepts shown in Figure A.1.

[SOURCE: IEC 60050-904:2014 [6], 904-03-04, modified - Subject field added, in Example 1 'off mode, partial on mode and on mode' replaced by 'non-active mode and active mode', Example 2 was amended, new 'Note 1 to entry' and 'Note 2 to entry' added. Note 1 to entry renumbered Note 3 to entry and reference to 'Table 1' replaced by reference to 'Figure A.1' and the table is deleted from the term entry.]

3.1.1.5
status information function
<of a product> function (3.1.1.1) by which the product provides usage-orientated information

EXAMPLE 1 Date, time, timer information, or past or future operation.

EXAMPLE 2 A reactivation function (3.1.1.7) indicated using a simple optical indicator (e.g. a light-emitting diode (LED)).

Note 1 to entry: Displayed content that relates to the primary function (3.1.1.2) of a display, e.g. displaying moving images, is not status information. The primary display of a product can provide status information in active mode (3.1.2.2) .

Note 2 to entry: Figure A.1 provides a structured overview as an aid to understanding functional relationships and energy use applicable in electrotechnical products. Additional terms and definitions to fulfil the particular needs of product sectors should be defined within the structure of the concepts shown in Figure A.1.

[SOURCE: IEC 60050-904:2014 [6], 904-03-07, modified - Subject field added, in the definition, the wording 'equipment provides simple use-oriented' replaced by 'product provides usage-oriented', original 'Note 1 to entry' was changed to 'EXAMPLE', new 'Note 1 to entry' added, in Note 2 to entry the reference to 'Table 1' replaced by reference to 'Figure A.1' and the table is deleted from the term entry.]

3.1.1.6
network integrity function
<of a product> function (3.1.1.1) to maintain a network (3.1.3.1) communication path external to the product

Note 1 to entry: The communication can be via wired or wireless interfaces.

Note 2 to entry: In order to communicate, it is necessary for the product to have at least one network port (3.1.3.5) activated.

Note 3 to entry: Figure A.1 provides a structured overview as an aid to understanding functional relationships and energy use applicable in electrotechnical products. Additional terms and definitions to fulfil the particular needs of product sectors should be defined within the structure of the concepts shown in Figure A.1.

[SOURCE: IEC 60050-904:2014 [6], 904-03-08, modified - Subject field added, in the definition and notes, 'equipment' replaced by 'product' and the word 'network' added, original 'Note 3 to entry' deleted, in Note 3 to entry the reference to 'Table 1' is replaced by a reference to 'Figure A.1' and the table is deleted from the term entry.]

3.1.1.7
reactivation function
<of a product> function (3.1.1.1) allowing a product to be switched into a different mode (3.1.2.1) with additional functions via an internal signal, manually using a control on the product, with a remote control unit, or via an externally initiated signal

EXAMPLE 1 A timer could provide the internal signal leading to reactivation.

EXAMPLE 2 The reactivation function may be indicated using a simple optical device (e.g. a light-emitting diode (LED)).

Note 1 to entry: The mode (3.1.2.1) after reactivation can be an active mode (3.1.2.2) .

Note 2 to entry: Figure A.1 provides a structured overview as an aid to understanding functional relationships and energy use applicable in electrotechnical products. Additional terms and definitions to fulfil the particular needs of product sectors should be defined within the structure of the concepts shown in Figure A.1. Figure A.2 provides a concept diagram.

[SOURCE: IEC 60050-904:2014 [6], 904-03-06, modified - Subject field added, definition extended to cover both internal reactivation function and 'network reactivation function', original Note 1 to entry reformatted as Example 2, new Note 1 to entry added, original Note 2 to entry deleted, in Note 2 to entry the reference to 'Table 1' is replaced by a reference to 'Figure A.1', the table is deleted from the term entry, and the sentence 'Figure A.2 provides a concept diagram' added.]

3.1.1.8
internal reactivation function
<of a product> reactivation function (3.1.1.7) where the product is switched into a different mode (3.1.2.1) via an internal signal, with its remote control unit, or manually using a control on the product

Note 1 to entry: Figure A.1 provides a structured overview as an aid to understanding functional relationships and energy use applicable in electrotechnical products. Additional terms and definitions to fulfil the particular needs of product sectors should be defined within the structure of the concepts shown in Figure A.1. Figure A.2 provides a concept diagram.

3.1.1.9
network reactivation function
<of a product> reactivation function (3.1.1.7) where the product is switched into a different mode (3.1.2.1) via an external signal through a network (3.1.3.1)

Note 1 to entry: Figure A.1 provides a structured overview as an aid to understanding functional relationships and energy use applicable in electrotechnical products. Additional terms and definitions to fulfil the particular needs of product sectors should be defined within the structure of the concepts shown in Figure A.1. Figure A.2 provides a concept diagram.

3.1.1.10
sensor-based function
<of a product> function (3.1.1.1) using a sensor to monitor a certain condition, internally or externally to the product

3.1.1.11
protective function
function (3.1.1.1) that operates to prevent harm to persons or damage to property

EXAMPLE Protective functions can operate in different modes, for instance:

– a back-siphonage device fitted to a dishwasher can operate in any non-active (3.1.2.3) modes,

– a flood protection device fitted to a washing machine can operate in any non-active (3.1.2.3) modes,

– a no-movement deactivation switch fitted to an iron can operate in an active mode (3.1.2.2) , and

– a touch control for a cooking hob requires a minimum of two activation steps (switch on and set level) to commence heating for the primary function (3.1.1.2) to prevent accidental operation.

Note 1 to entry: Figure A.1 provides a structured overview as an aid to understanding functional relationships and energy use applicable in electrotechnical products. Additional terms and definitions to fulfil the particular needs of product sectors should be defined within the structure of the concepts shown in Figure A.1.

[SOURCE: IEC 60050-904:2014 [6], 904-03-05, modified - The wording 'after the occurrence of a failure in the equipment so as' has been deleted from the definition. Mode names updated in Note 1 to entry. Note 2 to entry updated.]

3.1.1.12
emergency warning and alert function
EWF
<of a radio receiver> automatic receiver switching and emergency reactivation by alarm announcement broadcast signal

3.1.1.13
power management
power management function
automatic control mechanism that achieves within a preset timeframe, or other conditions, a certain power demand consistent with a pre-determined level of functionality

[SOURCE: IEC 60050-904:2014 [6], 904-03-01, modified - In the definition, the wording 'the smallest input power' has been replaced by 'within a preset timeframe, or other conditions, a certain power demand' and Note 1 to entry has been omitted.]

3.1.1.14
power supply function
<of a battery powered product> ability of the charging circuitry or power supply to directly power some or all of the functions of the battery powered product without drawing power from the battery

Note 1 to entry: This can include main batteries charging or main batteries removed.

Note 2 to entry: Chargers with a power supply function do not show the typical recharging pattern of chargers without a power supply function as the batteries are not permanently discharged by internal processes, display information and networked standby (3.1.2.5) energy use. This energy use can be supplied exclusively from the power supply unit or also proportionally from the battery and the power supply unit.

3.1.2 Mode related terms and definitions

3.1.2.1
mode
condition that has any combination of functions

Note 1 to entry: A mode with one or no functions can be a valid combination.

Note 2 to entry: Any transition of a product to a different mode, either through user intervention or automatically initiated, is not part of either mode.

Note 3 to entry: A mode can have functions with variable power draw.

Note 4 to entry: Figure A.1 provides a structured overview as an aid to understanding functional relationships and energy use applicable in electrotechnical products. Additional terms and definitions to fulfil the particular needs of product sectors should be defined within the structure of the concepts shown in Figure A.1.

3.1.2.2
active mode
on mode
mode (3.1.2.1) in which the product is connected to a power source and provides at least one primary function (3.1.1.2)