SLOVENSKI STANDARD
oSIST prEN IEC 63297:2024

01-november-2024

Senzorske naprave za sisteme nevsiljivega spremljanja obremenitve (NILM)

Sensing devices for non-intrusive load monitoring (NILM) systems

Ta slovenski standard je istoveten z: **prEN IEC 63297:2024**

ICS:

17.220.20	Merjenje električnih in magnetnih veličin	Measurement of electrical and magnetic quantities

oSIST prEN IEC 63297:2024 **en,fr,de**

85/933/CDV

COMMITTEE DRAFT FOR VOTE (CDV)

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IEC 63297 ED1	
DATE OF CIRCULATION:	CLOSING DATE FOR VOTING:
2024-09-27	**2024-12-20**
SUPERSEDES DOCUMENTS:	
85/911/CD, 85/930/CC	

IEC TC 85 : MEASURING EQUIPMENT FOR ELECTRICAL AND ELECTROMAGNETIC QUANTITIES	
SECRETARIAT:	SECRETARY:
China	Ms Guiju HAN
OF INTEREST TO THE FOLLOWING COMMITTEES:	HORIZONTAL FUNCTION(S):
TC 13,SC 23K,TC 38	
ASPECTS CONCERNED:	
Energy Efficiency	
☒ 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 Committee Draft for Vote (CDV) is submitted for parallel voting.

The CENELEC members are invited to vote through the CENELEC online voting system.

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Recipients of this document are invited to submit, with their comments, notification of any relevant patent rights of which they are aware and to provide supporting documentation.

Recipients of this document are invited to submit, with their comments, notification of any relevant “In Some Countries” clauses to be included should this proposal proceed. Recipients are reminded that the CDV stage is the final stage for submitting ISC clauses. (SEE AC/22/2007 OR NEW GUIDANCE DOC).

TITLE:

Sensing devices for non-intrusive load monitoring (NILM) systems

PROPOSED STABILITY DATE: 2028

NOTE FROM TC/SC OFFICERS:

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

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SENSING DEVICES FOR NON-INTRUSIVE LOAD MONITORING (NILM) SYSTEMS

FOREWORD

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IEC 63297 has been prepared by IEC technical committee 85: Measuring equipment for electrical and electromagnetic quantities.

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

Enquiry draft	Report on voting

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

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 publication will remain unchanged until the stability date indicated on the IEC website under "http://webstore.iec.ch" in the data related to the specific publication. At this date, the publication will be

- reconfirmed,
- withdrawn,
- amended, or
- revised.

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INTRODUCTION

Non-intrusive load monitoring (NILM), or non-intrusive appliance and load monitoring (NIALM), is a process for providing estimated energy usage, e.g. by type of use (heating, cooling, etc.) or type of appliance (microwave, etc.) based on load signatures at a single point in the installation.

NILM systems can be used to survey the specific uses of electrical power in homes, buildings or industrial areas (see Figure 1).

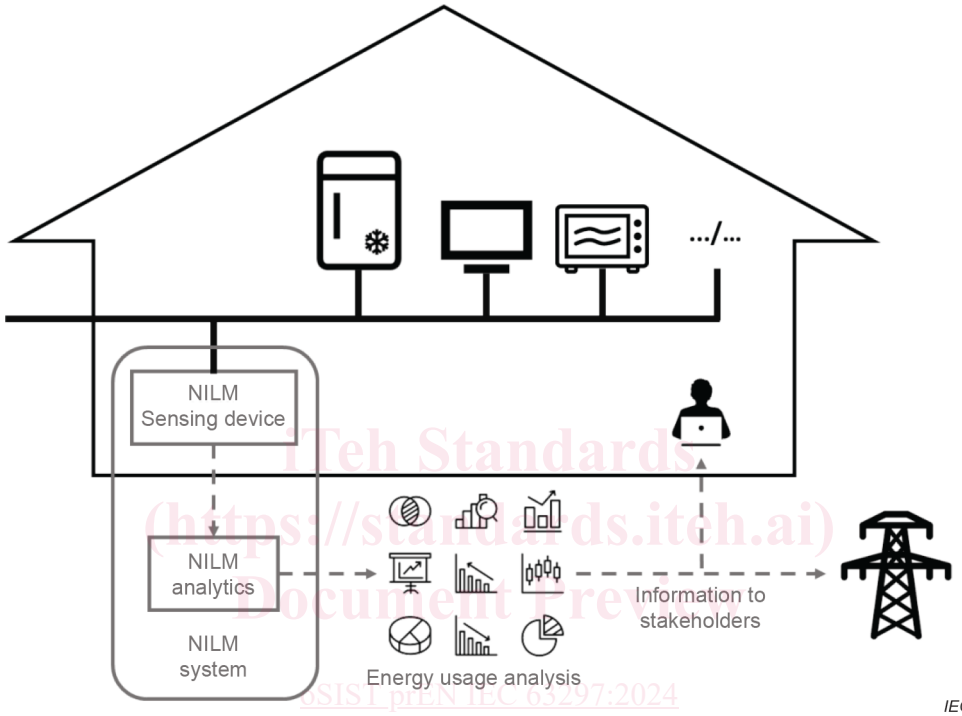

Figure 1 – Principle of non-intrusive load monitoring (NILM)

At the moment, NILM systems are essentially used in AC distribution networks, but DC networks are not excluded.

SENSING DEVICES FOR NON-INTRUSIVE LOAD MONITORING (NILM) SYSTEMS

1 Scope

This International Standard provides a classification of NILM sensing devices for use in NILM systems, according to the state of the art of NILM technologies.

The classification of NILM analytics and NILM systems, as well as performance indicators for NILM systems, can be considered in the future.

NILM systems produce estimated disaggregation into energy usages. When accurate measurement and analysis of energy consumption and/or other electrical parameters is needed (e.g. for monitoring the electrical installation), systems based on standardized measuring devices (e.g. PMD, PQI or meters) are used.

NOTE Standardized measuring devices have guaranteed accuracy over a specified range and have limited deviations in presence of influence quantities (temperature, frequency deviations…) in addition to safety and constructional requirements. See Annex C for more information.

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 61557-12:2018, *Electrical safety in low voltage distribution systems up to 1 000 V AC and 1 500 V DC – Equipment for testing, measuring or monitoring of protective measures – Part 12: Power metering and monitoring devices (PMD)*

3 Terms and definitions

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

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

3.1
electrical parameter
electrical quantity to be measured or estimated

EXAMPLE RMS value of current, RMS value of voltage, active power, reactive power, harmonics, power quality related parameters, etc.

3.2
estimated value
value of an electrical parameter (e.g. current, power, energy related to a specific usage) produced by a NILM sensing device or a NILM system

Note 1 to entry: Estimated values are typically less accurate than values measured with standardized measuring devices (e.g. PMD, PQI, meters).

3.3
measured value
value of an electrical parameter (e.g. current, power, energy related to a specific usage) produced by a measuring device complying with an electrical measurement standard

Note 1 to entry: Example of measuring devices complying with an electrical measurement standard include PMD, PQI and meters.

3.4
load signature
pattern in the data produced by a NILM sensing device that can be attributed to a specific type of load or energy usage

3.5
non-intrusive load monitoring
NILM
process for providing estimated categorization of energy usage based on load signatures obtained at a single point in the installation

3.6
NILM analytics
process for analyzing data produced by a NILM sensing device and providing information about energy usage

Note 1 to entry: NILM analytics can be performed within the NILM sensing device and/or in the cloud.

3.7
NILM sensing device
NSD
device connected to the electrical installation and producing data to be used by NILM analytics

3.8
NILM system
combination of a NILM sensing device and NILM analytics

3.9
power metering and monitoring device
PMD
combination in one or more devices of several functional modules dedicated to metering and monitoring electrical parameters in energy distribution systems or electrical installations, used for applications such as energy efficiency, power monitoring and network performance

Note 1 to entry: Under the generic term “monitoring” are also included functions of recording, alarm management, etc.

Note 2 to entry: PMDs have a known measurement uncertainty over a specified measurement range and are robust to influence quantities and industrial environments

[SOURCE: IEC 61557-12:2018, 3.1.1, modified – Note 2 to entry has been modified and Note 3 to entry has been added]

3.10
power quality instrument
PQI
instrument complying with IEC 62586-1 whose main function is to measure, record and possibly monitor power quality parameters in power supply systems, and whose measuring methods (class A or class S) are defined in IEC 61000-4-30