



BSI Standards Publication

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

National foreword

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TECHNICAL SPECIFICATION



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

INTERNATIONAL
ELECTROTECHNICAL
COMMISSION

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

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

FOREWORD

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The text of this Technical Specification is based on the following documents:

Draft	Report on voting
85/727/DTS	85/750/RVDTS

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 Technical Specification 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 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

- transformed into an International standard,
- reconfirmed,
- withdrawn,
- replaced by a revised edition, or
- amended.

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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).

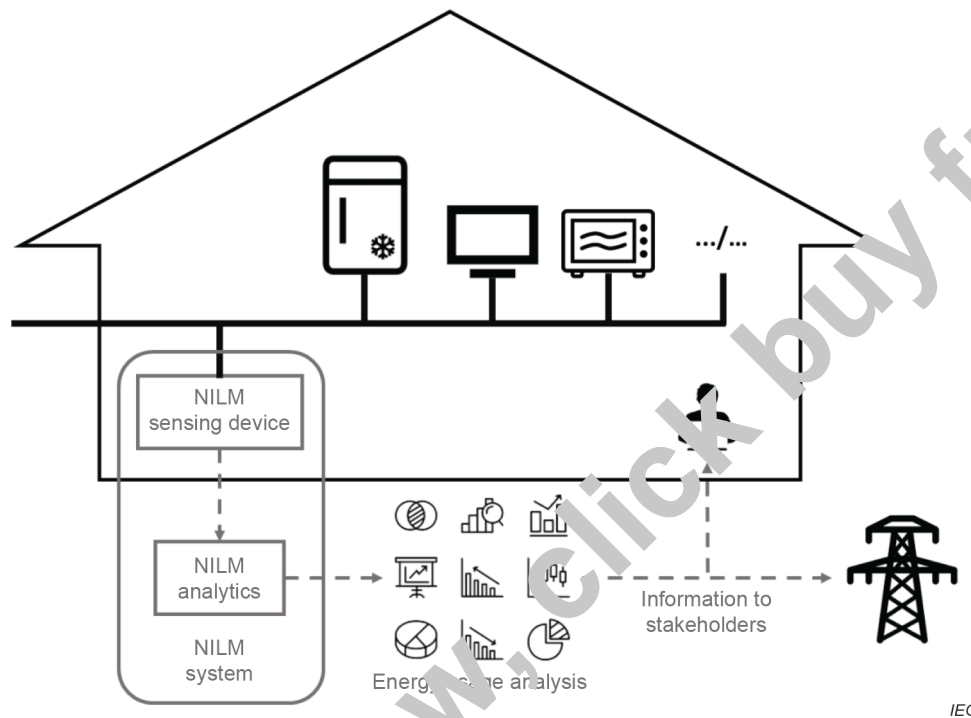


Figure 1 – Principle of Non-intrusive load monitoring (NILM)

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 Technical Specification is an attempt to provide 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 defined range and have limited deviations in presence of influence quantities (temperature, frequency deviations, etc.) in addition to safety and constructional requirements. See Annex C for more information.

2 Normative references

There are no normative references in this document.

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