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Information technology – Home electronic system – Guidelines for product interoperability –

Part 1: Introduction

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INFORMATION TECHNOLOGY – HOME ELECTRONIC SYSTEM – GUIDELINES FOR PRODUCT INTEROPERABILITY –

Part 1: Introduction

FOREWORD

1) ISO (International Organization for Standardization) and IEC (International Electrotechnical Commission) form the specialized system for worldwide standardization. National bodies that are members of ISO or IEC participate in the development of International Standards through technical committees established by the respective organization to deal with particular fields of technical activity. ISO and IEC technical committees collaborate in fields of mutual interest. Other international organizations, governmental and non-governmental, in liaison with ISO and IEC, also take part in the work.

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International Standard ISO/IEC 18012-1 was prepared by subcommittee 25: Interconnection of information technology equipment, of ISO/IEC joint technical committee 1: Information technology.

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

ISO/IEC 18012 consists of the following parts, under the general title *Information technology – Home electronic system – Guidelines for product interoperability*:

- *Part 1: Introduction*
- *Part 2: Taxonomy and lexicon*
- *Part 3: Application models*

INTRODUCTION

The widespread development of many national standard and proprietary networks within and to the home has necessitated a standard for interoperability among home system applications. This standard will ensure that applications on the same or dissimilar networks co-exist within premises and are required to interoperate, they will do so in a safe, reliable, predictable and consistent manner. This part defines the components of interoperability for the purpose of providing a framework within which subsequent parts of the standard will be drafted. This part applies to components within networks, between networks and located within dissimilar networks. It also applies to devices located at the junction of dissimilar networks.

In the field of home and building automation, products from multiple manufacturers may need to interoperate. Where widely varying devices need to interoperate, it is desirable that they do so seamlessly to present a single, uniform network and hence to deliver a variety of applications. Examples of such applications are lighting control, environmental control, audio/video equipment control and home security.

With reference to Figure 1, where there are two (or more) dissimilar networks within the same premises, they must conform to this standard if, when linked by some physical means, they are expected to behave as if both networks were logically the same network.

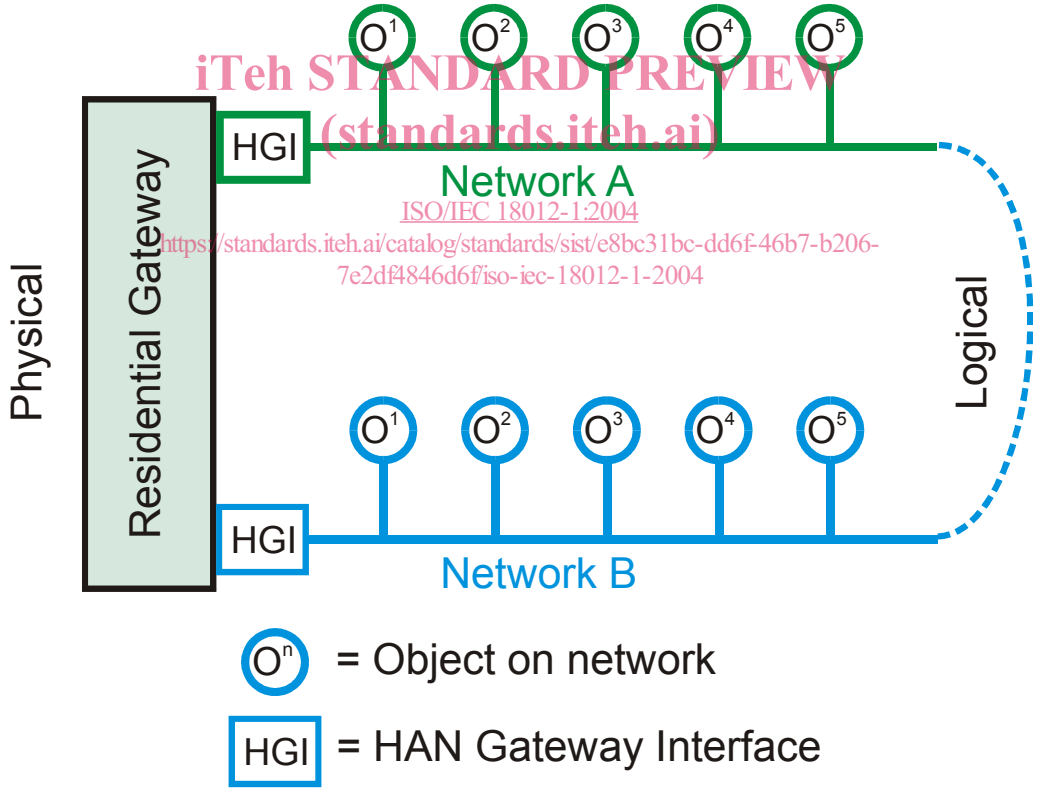

Figure 1 – Two interoperating networks

This document comprises the following sections.

- A conformance section (clause 4) with which all interoperating networks and intermediary equipment on the home electronic system comply.
- A requirements section (clause 5) that defines the normative functional safety requirements of product interoperability of HES products and networks, where these are not covered by existing functional safety standards.
- A requirements section (clause 6) that defines the management of product interoperability among HES products and networks.
- A requirements section (clause 7) that defines the normative operational requirements of product interoperability among HES products and networks.

INFORMATION TECHNOLOGY – HOME ELECTRONIC SYSTEM – GUIDELINES FOR PRODUCT INTEROPERABILITY –

Part 1: Introduction

1 Scope

This part of ISO/IEC 18012 specifies requirements for product interoperability in the area of home and building automation systems. It specifies layers six and seven of the OSI reference model (see ISO/IEC 7498-1) with sufficient detail needed to design interoperable home electronic system products, while layers one to five are only specified to the point needed to check whether devices will be able to interoperate with one another.

ISO/IEC 18012-1 is applicable to

- stand-alone local/home networks, connected devices and applications,
- mixed local/home networks, connected devices and applications,
- automatically configured devices,
- installer configured devices,
- installer configured groups/clusters of devices.

ISO/IEC 18012-1 specifies interoperability for system set-up, operation and management applied to devices connected to a single home control system or to different home control systems. Although a single uniform home control system would simplify operations, this standard recognises that multiple different networks may co-exist in the same house. This standard specifies requirements to assure that devices from multiple manufacturers work together to provide a specific application. Also, a specific device could be used for multiple applications.

ISO/IEC 18012-1 specifies interoperability requirements with respect to

- safety,
- addressing,
- applications,
- transport of information,
- set-up of devices/elements within home networks – static and/or dynamic binding between objects,
- management.

This document does not specify how two home control systems share a common resource or how to ensure that two home control systems used within the same premises do not interfere with each other. However, this document requires that two home control systems may share a common resource, and that they do not interfere with one another.

2 Normative references

The following referenced documents are indispensable for the application 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.

ISO/IEC 7498-1:1994, *Information technology – Open Systems Interconnection – Basic Reference Model: The Basic Model*

ISO/IEC TR3 14762, *Information technology – Home Control Systems – Guidelines for Functional Safety*

3 Terms, definitions and abbreviations

3.1 Definitions

For the purposes of this International Standard, the following definitions apply.

3.1.1
API
application programming interface
collection of invocation methods and associated parameters used by one piece of software to request actions from another piece of software

3.1.2
co-existence
two or more networks within premises that do not interfere with one another

3.1.3
component
logical subunit of a larger, encompassing concept

NOTE The concept of interoperability is broken down into constituent components such as safety, management and operation. These constituent components are further broken down within their respective sections. The term component is also used to refer to logical subunits of system architecture concepts, such as the components of a networking implementation (for example, addressing).

3.1.4
device
distinct physical unit on a network

NOTE It can either be an end node on the network, or an intermediate node (as in the case of a network gateway device connecting two distinct physical networks).

3.1.5
interoperability
logical entities functioning together for applications on a network

3.1.6
network
distinct interconnection of devices that share a single physical layer implementation in terms of the OSI layered network model

NOTE See ISO/IEC 7498-1:1994.

3.1.7
object
unit of software functionality

NOTE This definition is similar to that traditionally used in object-oriented programming.

3.1.8
product
device or network that may be purchased to constitute a Home Electronic System

3.1.9
single implementation
single, homogeneous network implementation, where interoperability is only of concern within the single network

3.1.10
multiple implementation
mixed collection of two or more network implementations

NOTE To establish interoperability, each network has a routing path to every other network in the system. This path may involve one or more hops through multiple intermediate networks.

3.1.11
intermediate implementation
mixed collection of two or more network implementations

NOTE To establish connectivity, an intermediate implementation provides for a common intermediate translation between any two networks, assuring a worst-case translation path of two hops (from any network to the common translation, and then from the common translation to the destination network).

3.2 Abbreviations

API	Application Programming Interface
HAN	Home Area Network
HES	Home Electronic System
OSI	Open Systems Interconnect (ISO/IEC 7498-1)

4 Conformance clauses

4.1 Basic functions and requirements

HES products and networks shall implement the requirements of this standard when at least one of the following conditions is met:

- two or more dissimilar HANs are installed or implemented in premises;
- two or more dissimilar HANs are required to interoperate or interwork in premises;
- a product acts as a bridge, router, gateway or residential gateway between two or more dissimilar HANs in premises.

4.2 Compliance of qualifying products and networks

In order to conform to this standard, products and networks in the cases described in 4.1 shall:

- implement functional safety as specified in ISO/IEC TR 14762 ;
- implement measures to avoid or minimise potential hazards as specified in Clause 5: