

# INTERNATIONAL STANDARD

# ISO/IEC 18012-1

First edition  
2004-02

---

---

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

### Part 1: Introduction

© ISO/IEC 2004

All rights reserved. Unless otherwise specified, no part of this publication may be reproduced or utilized in any form or by any means, electronic or mechanical, including photocopying and microfilm, without permission in writing from the publisher.

ISO/IEC Copyright Office • Case postale 56 • CH-1211 Genève 20 • Switzerland

---

---



PRICE CODE

**F**

*For price, see current catalogue*

## CONTENTS

1	Scope	7
2	Normative references	8
3	Terms, definitions and abbreviations	8
3.1	Definitions	8
3.2	Abbreviations	9
4	Conformance clauses	9
4.1	Basic functions and requirements	9
4.2	Compliance of qualifying products and networks	9
5	Functional safety	10
5.1	Introduction	10
5.2	Commands to potentially hazardous devices	11
5.3	Commands to relocatable programmable devices	11
5.4	Commands to automatic devices	11
5.5	Command translation	11
5.6	Linked state changes	11
5.7	External control of secure devices	12
5.8	Addressing	12
5.9	Broadcast messages, variables and commands	12
5.10	General	12
6	Management	12
6.1	General	12
6.2	Configuration	12
6.3	Configuration process	13
6.3.1	General	13
6.3.2	Expert installer configuration	14
6.3.3	Easy configuration	14
6.3.4	Automatic configuration	14
6.3.5	Multiple network and dissimilar network configuration	14
7	Operation	14
7.1	Introduction	14
7.2	Addressing	15
7.2.1	Transport-independent format	15
7.2.2	Broadcast addressing	15
7.2.3	Individual node addressing	15
7.2.4	Group addressing	15
7.3	Transport connectivity	15
7.3.1	General	15
7.3.2	Single implementation	15
7.3.3	Multiple implementation	16
7.3.4	Intermediate implementation	16
7.4	Information encapsulation	16
7.4.1	Common value type primitives	16
7.4.2	Capability exchange	16
7.4.3	Parameter and state encapsulation	16
7.5	Application models and lexicon	16

Figure 1 - Two interoperating networks .....	5
Table 1 - Configuration levels .....	13

# 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.
- 2) In the field of information technology, ISO and IEC have established a joint technical committee, ISO/IEC JTC 1. Draft International Standards adopted by the joint technical committee are circulated to national bodies for voting. Publication as an International Standard requires approval by at least 75 % of the national bodies casting a vote.
- 3) All users should ensure that they have the latest edition of this publication.
- 4) No liability shall attach to IEC or ISO or its directors, employees, servants or agents including individual experts and members of their technical committees and IEC or ISO member bodies for any personal injury, property damage or other damage of any nature whatsoever, whether direct or indirect, or for costs (including legal fees) and expenses arising out of the publication of, use of, or reliance upon, this ISO/IEC publication or any other IEC, ISO or ISO/IEC publications.
- 5) Attention is drawn to the normative references cited in this publication. Use of the referenced publications is indispensable for the correct application of this publication.
- 6) Attention is drawn to the possibility that some of the elements of this International Standard may be the subject of patent rights. ISO and IEC shall not be held responsible for identifying any or all such patent rights.

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.

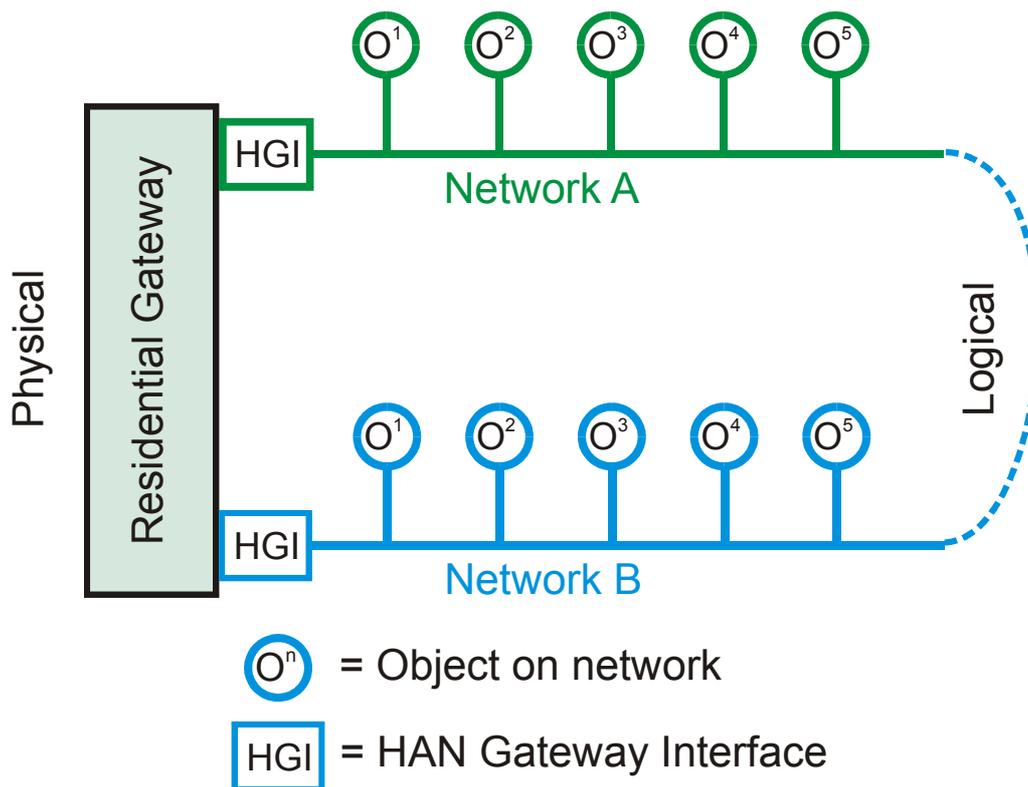


Figure 1 – Two interoperating networks

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*