

GUIDE

Home control systems – Guidelines relating to safety

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INTERNATIONAL
ELECTROTECHNICAL
COMMISSION

PRICE CODE

M

ICS 13.120; 97.200

ISBN 978-2-8322-1517-3

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

**HOME CONTROL SYSTEMS –
GUIDELINES RELATING TO SAFETY****FOREWORD**

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This second edition of IEC Guide 110 has been prepared, in accordance with the ISO/IEC Directives, Part 1, Annex A, by the IEC Advisory Committee on Safety (ACOS). This is a non-mandatory guide in accordance with SMB Decision 136/8.

This second edition of IEC Guide 110 cancels and replaces the first edition published in 1996.

The main changes with respect to the previous edition are as follows (minor changes are not listed):

- addition of several new electrical safety aspects;
- inclusion of cyber security;
- consistent use of the term “equipment” to replace terms such as “device”, “system”, “product”, etc.;
- bringing the document structure in line with the latest ISO/IEC Directives;

- updating the references to standards and IEC technical committees to reflect the current situation.

The text of this Guide is based on the following documents:

Four months' vote	Report on voting
C/1785A/DV	C/1796/RV

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

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

A bilingual version of this publication may be issued at a later date.

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HOME CONTROL SYSTEMS – GUIDELINES RELATING TO SAFETY

1 Scope

This Guide provides background information to technical committees when dealing with safety requirements for products intended to be integrated in a home control system. It includes information on functional safety as well as conventional safety aspects relevant to home control systems.

This Guide defines the safety-related characteristics of systems intended for signal transmission through building wiring carrying low voltage or extra low-voltage, through fibre optics, through air or by electromagnetic waves in household and similar premises (home control systems).

This Guide deals with home control systems providing control communication for equipment used within homes. This includes the control of equipment for cooling, heating, lighting, audio/video, telecommunications, security, etc., in fact, any equipment controlled by the home control system. It also includes residential gateways between the internal home control system network and external wide-area networks such as the internet. The Guide also covers similar building management functions in commercial buildings of similar complexity.

EMC aspects are not covered, since these are dealt with by IEC Guide 107.

2 Normative references

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The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

IEC 60950-1:2005, *Information technology equipment – Safety – Part 1: General requirements*

ISO/IEC Guide 51, *Safety aspects – Guidelines for their inclusion in standards*

EN 50491-3, *General requirements for home and building electronic systems (HBES) and building automation and control systems (BACS) – Part 3: Electrical safety requirements*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO/IEC Guide 51 as well as the following apply.

3.1

home network

internal network for digital and analog information transport in a single family dwelling or business premises of similar complexity, providing defined access points and using any transmission medium in any topology

3.2

home control system

home network together with all the equipment attached to it, including the rules for control, communication and management among application processes

3.3

application protocol

standardized language, used by application processes to exchange information in a home control system, transported without interpretation by the home network resources

3.4

functional safety

ability of a home control system to carry out the actions necessary to achieve and maintain an appropriate level of safety both under normal conditions and in case of a fault that might result in a hazard

4 Home control systems

A variety of electrically-controlled equipment may be used in homes and similar environments for many different applications.

Examples of such applications are:

- lighting;
- heating;
- washing;
- entertainment (audio/video);
- energy management;
- water control;
- fire alarm;
- blinds control;
- garage door openers;
- different forms of security control (audio/video).

When several pieces of equipment are able to interwork via a home network, wired or wireless, the resulting total system is referred to as a home control system.

A home network may be based on different transmission media (for example, power network, twisted pair, infrared or radio, wireless) and may also be connected to outside networks (for example, telephone networks, cable networks).

A home control system will typically first be assembled to cover certain basic applications, for example control of lighting, heating and ventilation. It may include equipment from different manufacturers. This equipment is, in many cases, the responsibility of different IEC product committees.

Furthermore, it is likely that the system will be later extended to cover more applications. In many cases, these extensions will not be made by the person who installed the original system.

In a conventional electrical installation system, each function needs its own cable and each control system is a separate network. In contrast, a home electronic system may enable sensing, switching, control, monitoring and signaling on all functions and sequences by a single wired or wireless connection. The power can be directly connected to a piece of equipment or may be derived from the network.

A home control system comprises a network for transmission of signals between pieces of equipment connected to the home network. The equipment is connected via an interface. The interface may be integrated into the equipment. All pieces of equipment connected to the home control system may be able to communicate with one another without the need for a central computer.

The size of the home control system can vary from only a few types up to hundreds of different types of equipment, connected as one system.

The home network is intended for general control applications and allows several topologies, as shown in Figure 1. Combinations of the topologies are possible.

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