

# INTERNATIONAL STANDARD

# ISO/IEC 10192-1

First edition  
2002-08

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**Information technology –  
Home electronic system (HES) interfaces**

**Part 1:  
Universal Interface (UI) Class 1**

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### Part 1: Universal Interface (UI) Class 1

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# INFORMATION TECHNOLOGY – HOME ELECTRONIC SYSTEM (HES) INTERFACES –

## Part 1: Universal Interface (UI) Class 1

### 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 JTC1. 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.

The International Organization for Standardization (ISO) and the International Electrotechnical Commission (IEC) draw attention to the fact that the European Patent EP PS 0 344 609 B1 "Digital signal transmission system for domestic application" may be needed to implement this International Standard.

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International Standard ISO/IEC 10192-1 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.

Annexes A and B are for information only.

# INFORMATION TECHNOLOGY – HOME ELECTRONIC SYSTEM (HES) INTERFACES –

## Part 1: Universal Interface (UI) Class 1

### 1 Scope and application

#### 1.1 Scope

This part of ISO/IEC 10192 is one of a set of standards describing the characteristics of a specific home control system called the Home Electronic System, HES.

This standard specifies the characteristics of the Universal Interface Class 1 that connects devices to the home network in an HES for control applications.

This standard informs as to the usefulness of the principles of a UI and forms a basis for new work in this field.

NOTE This standard draws upon text from IEC 60870-5-1:1990 and IEC 60870-5-2:1992.

#### 1.2 Application

This standard specifies a generic interface for a device to connect to a home control network via a Network Adaptor Unit. The home control network signals may be carried on the cabling system being specified in ISO/IEC 15018<sup>1</sup>.

### 2 Normative references

[ISO/IEC 10192-1:2002](https://standards.iteh.ai/catalog/standards/sist/e1163866-0d39-4f48-a696-f62fa2e80000/iso-iec-10192-1-2002)

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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.

IEC 60227-2, *Polyvinyl chloride insulated cables of rated voltages up to and including 450/750V – Part 2: Test methods*

IEC 60364-1, *Electrical installations of buildings - Part 1: Fundamental principles, assessment of general characteristics, definitions*

IEC 60603-7, *Connectors for frequencies below 3 MHz for use with printed boards – Part 7: Detail specification for connectors, 8-way, including fixed and free connectors with common mating features, with assessed quality*

IEC 60664-1, *Insulation coordination for equipment within low-voltage systems – Part 1: Principles, requirements and tests*

IEC 60870-5-1:1990, *Telecontrol equipment and systems – Part 5: Transmission protocols – Section 1: Transmission frame formats*

ISO/IEC 11801, *Information technology – Generic cabling for customer premises*

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<sup>1</sup> Information technology - Integrated cabling for residential and SOHO (Small Office, Home Office) environments (under development).

ISO/IEC TR 14543-1, *Information technology – Home Electronic System (HES) Architecture – Part 1: Introduction*

ISO/IEC TR 15044, *Information technology – Terminology for the Home Electronic System (HES)*

### 3 Definitions and abbreviations

#### 3.1 Definitions

For the purposes of this document the following definitions apply.

##### 3.1.1

###### **network powered device, NPD**

device that derives its power from the network

[ISO/IEC TR 15044, definition 2.38]

##### 3.1.2

###### **self-powered device, SPD**

device which derives its power from other sources than the network

[ISO/IEC TR 15044, definition 2.50]

##### 3.1.3

###### **UI adaptation**

process of adapting a device or an NAU to the UI

[ISO/IEC TR 15044, definition 2.68]

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##### 3.1.4

###### **UI cable**

cable connecting with an UI device to a UI NAU. The UI connector on the NAU is normally mounted in the wall

[ISO/IEC TR 15044, definition 2.69]

##### 3.1.5

###### **UI cable connector**

standardized connector on a UI cable for connecting a UI device to a UI NAU

NOTE The device end of the cable may have a connector or be permanently attached to the device.

[ISO/IEC TR 15044, definition 2.70]

##### 3.1.6

###### **UI cable plug housing, UI CPH**

connector housing for the NAU end of the UI cable

[ISO/IEC TR 15044, definition 2.71]

##### 3.1.7

###### **UI connector, UIC**

connector on a UI NAU for connecting a UI device to a UI NAU

NOTE The UI connector is normally mounted in the wall.

[ISO/IEC TR 15044, definition 2.72]



**3.1.8****UI device, UID**

device supporting and offering a UI

NOTE If the context makes it clear that a device is a UI device, UI will normally be omitted from the term.

[ISO/IEC TR 15044, definition 2.73]

**3.1.9****UI device connector**

optional connector on a UI device for connection of a UI cable. The cable may instead be permanently attached to the device

[ISO/IEC TR 15044, definition 2.74]

**3.1.10****UI network access unit, UI NAU**

NAU supporting and offering the universal interface

NOTE If the context makes it clear that the NAU is a UI NAU, UI is normally omitted.

[ISO/IEC TR 15044, definition 2.75]

**3.1.11****universal interface, UI**

standardized interface, placed on top of the network layer, between a home network and the devices to be connected to it. The specification of the UI includes the necessary mechanical, electrical, functional and procedural characteristics of the interface. Three classes of UIs are defined corresponding to the three classes of home control systems

[ISO/IEC TR 15044, definition 2.76]

[ISO/IEC 10192-1:2002](https://standards.iteh.ai/catalog/standards/sist/e1163866-0d39-4f48-a696-f62fa2e80000/iso-iec-10192-1-2002)

**3.2 Abbreviations**

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The following abbreviations are used in this document.

EP UI NAU	externally powered UI NAU
HES	Home Electronic System
NAU	network access unit
NP	network powered
NPD	network powered device
OSI	Open Systems Interconnection
OSI/RM	Open Systems Interconnection Reference Model
SP	self-powered
SPD	self-powered device
UI	Universal Interface
UIC	UI connector
UID	UI device

#### 4 Principles of the UI

In principle the UI is placed above layer 3 (network layer) in the OSI/RM stack. It provides a standardized interface between the home network on one side and the devices on the other side. The UI is connected to a home network via the UI Network Access Unit (NAU). The mechanical, electrical, functional and procedural characteristics of the UI itself are standardized in this document, but the NAU is not standardized. This makes it possible to provide specific NAUs that fit specific home networks on the market. The NAU, however, shall supply the HES Network Service standardized in ISO/IEC 14543-1 to the device connected to it. In an HES the UI will also pass transparently the HES Application Protocol standardized in ISO/IEC 14543-1. The NAU shall also contain implementations of layers 1 and 2 for the local network. The UI connected to a network based on wired (metallic) media always provides a limited amount of electrical power from the home network system to the connected device.

NOTE For completeness, Annex A defines an NAU for those home control networks that do not provide electrical power (e.g. Infra-red, Radio-frequency etc.).

Specifications of the UI adaptation are under some aspects different in the case in which the UI device does or does not use the power feed provided by the UI NAU. Consequently, two different types of connection between an UI NAU and an UI device are defined. The block diagrams of the two connection types are shown in Figure 1.

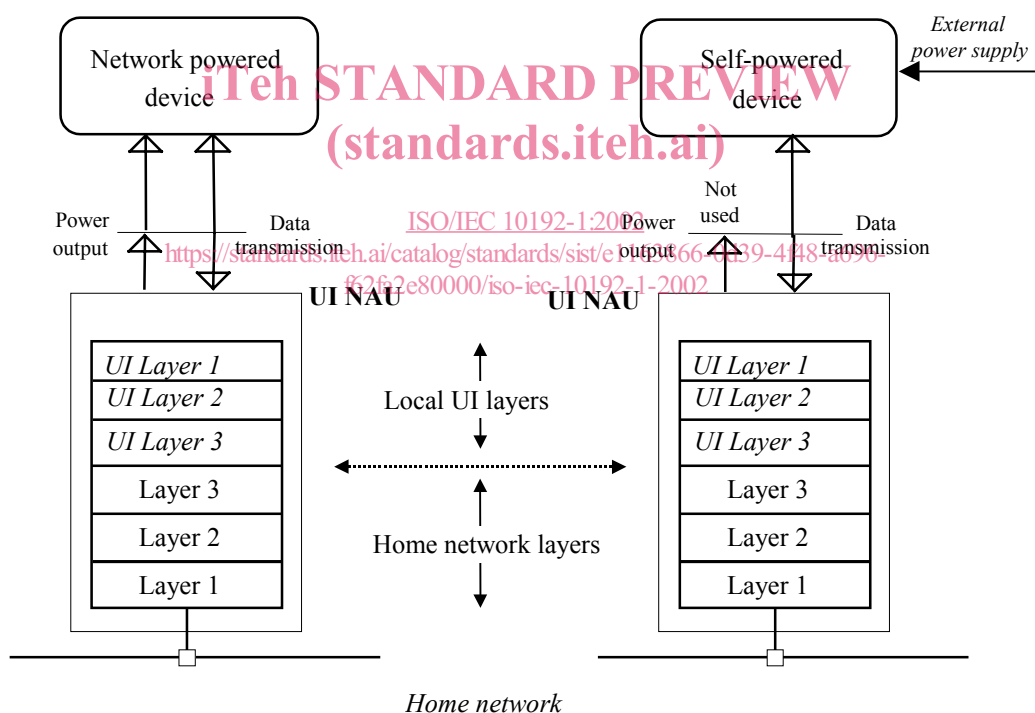


Figure 1 – UI connections in a home network providing a power-feed service

## 5 Connectors and cabling

### 5.1 Mechanical characteristics

#### 5.1.1 UI NAU connector housing and connector

##### 5.1.1.1 UI NAU connector housing

The UI NAU connector housing is a mechanical adapter that can be fitted into an electrical box or be surface mounted. It contains a socket that should meet IEC 60603-7.

##### 5.1.1.2 UI NAU connector

The electrical and mechanical characteristics of the UI NAU connector shall conform to IEC 60603-7.

The UI NAU jack connector shall accept both the connection to a UI cable connector and to a UI cable connector housing, as shown in figure 4.

#### 5.1.2 UI cabling

The UI cable connects a UI device (NP device or SP device) to a UI NAU. Different UI cables are specified for the two types of connection, see Figure 2.

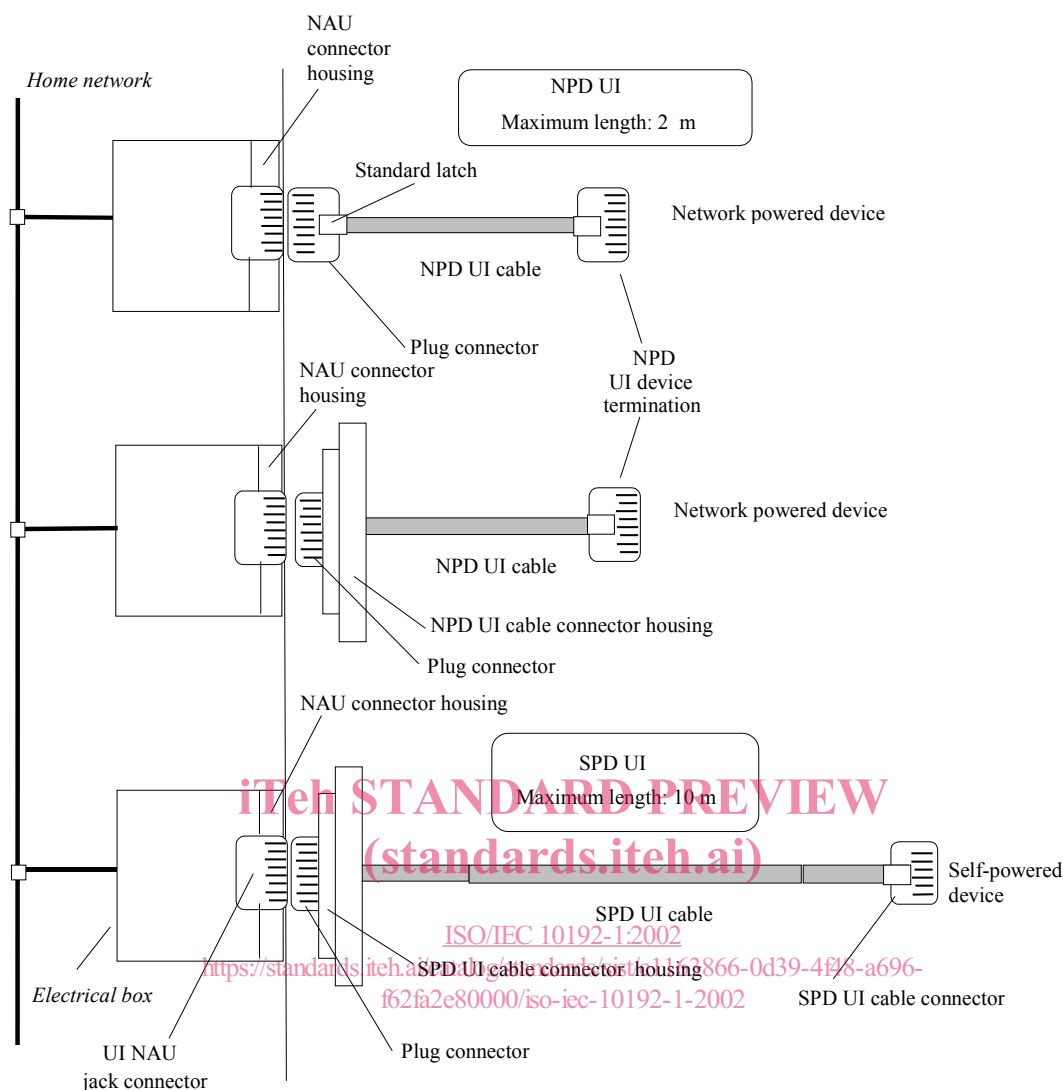
The maximum cable lengths defined for the NP and SP connection are:

NP Device connection: maximum cable length,  $L = 2$  m

SP Device connection: maximum cable length,  $L = 10$  m

ISO/IEC 10192-1:2002

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**Figure 2 – UI cables**

The UI cable (see Figure 2) will be mechanically retained in the NAU connector housing by

- the standard plug connector latch in the case in which no UI cable connector housing is used,
- a latch built into the UI cable connector housing when this is used.

In this second case the standard plug connector latch no longer operates.

**5.1.2.1 UI cable connectors**

The terminations of the UI cables for UI NAU and UI device ends are specified below for both types of connection.

NP device connection: the NP UI cable could terminate at the UI NAU end with a plug connector to mate the UI NAU socket specified in 5.1.1, or with a UI cable connector housing. The connector housing shall provide the mechanical characteristics and the plug connector to mate the outlet specified in 5.1.1. The UI cable can terminate at the UI device end with a connector or be permanently attached to the UI device.

SP device connection: the SP UI cable terminates at the UI NAU end with a UI cable connector housing that shall provide the mechanical characteristics and the plug connector to mate the outlet specified in 5.1.1.