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Information technology –

Terminology for the Home Electronic System (HES)

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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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ISO/IEC 15044, which is a technical report of type 2, was prepared by subcommittee 25: Interconnection of information technology equipment, of ISO/IEC joint technical committee 1: Information technology.

International Standards are drafted in accordance with ISO/IEC directives, Part 3.

This document is issued in the type 2 technical report series of publications (according to 15.2.2 of the Procedures for the technical work of ISO/IEC JTC 1 (1998)) as a prospective standard for provisional application in the field of the Home Electronic System (HES), because there is an urgent requirement for guidance on how standards in this field should be understood.

This document is not to be regarded as an International Standard. It is proposed for provisional application so that information and experience of its use in practice may be gathered. Comments on the content of this document should be sent to the IEC Central Office.

A review of this type 2 technical report will be carried out not later than three years after its publication with the option of extension for a further three years or conversion either to an International Standard or withdrawal.

INFORMATION TECHNOLOGY – TERMINOLOGY FOR THE HOME ELECTRONIC SYSTEM (HES)

1 Scope

The home electronic system (HES) provides a common method for interfacing equipment with a variety of home control systems (HCS) such as sensors, actuators, appliances, user interfaces, controllers, switches etc. An HCS is a local area network specialized for residential communications, commonly called home automation.

This terminology is applicable to all standards and technical reports dealing with HES.

2 Terminology

2.1
application
field of use of an HES. An HES may support more than one application

2.2
application object
an HES object located within the HES device application process

2.3
application process
an element within an HES which performs the information processing for a particular application

2.4
application protocol
standardized protocol for the exchange of information between application processes in an HES. It is transported without interpretation by the home network resources

2.5
architecture
conceptual structure of systems that are to communicate with each other

2.6
bridge
functional unit interconnecting two home network systems that use the same network layer protocol but where there may be some differences in the link layer protocol

2.7
classes of home control systems
characterization of home control systems based on their transport capabilities

2.8
connection
association established between two peer entities across a network (or part of a network) for the purpose of communication between the entities. The association is explicitly established at some point in time, and exists until explicitly ended

2.9
connection-mode service
service providing communication between two entities within the context of a connection established between the entities

2.10
connectionless-mode service
service providing communication between two entities not within the context of a connection established between the entities

2.11
control channel
a communication channel that is established between two or more entities for the primary purpose of exchange of HES control and monitoring messages

2.12
controller
any device with the capability of controlling and possibly monitoring other devices

2.13
device
physical implementation of functions belonging to one or more functional groupings providing a service directly for an end-user

2.14
device application process
element within a device that performs information processing for a particular application. Device application processes can represent manual, automated, computerized or physical processes

2.15
domain
range of validity

NOTE When used for a specific concept, the exact domain should be stated, for example application domain, user domain.

2.16
end user
entity outside the home control system domain that uses the services and functions of the home control system

2.17
flow control
function that controls the flow of data within a layer. It regulates the rate at which information is exchanged between peer entities

2.18
functional grouping
set of functions performing part of the operations of a home control system

NOTE The functions in a functional grouping might be performed in one or more pieces of equipment and the functions of several functional groupings might be performed in one piece of equipment.

2.19
gateway
unit connecting different networks or parts of one network and performing any necessary protocol translation

2.20
HES device application process
that part of a device application process that is accessible through the HES communication network. An HES device application process is built up from application objects. The functionality of the HES device application process is defined in this series of standard or in appropriate product standards

2.21
HES home network
home network supporting and including Universal Interfaces

2.22
home control system
home network together with all the devices attached to it, including the rules for control, communication and management among application processes. Three classes of home control systems are defined

2.23
home control system class 1
home control system with transport capabilities for telecontrol applications such as:

– control
– monitoring
– measurement
– alarm
– low-speed data transfer

NOTE These capabilities are typically provided by:

– single packet-mode low bandwidth channel
– digital transmission.

2.24
home control system class 2
home control system with class 1 transport capabilities plus:

– switched voice or other information transfer of similar bandwidth

NOTE These capabilities are typically provided by a class 1 system enhanced with:

– multiple switched medium bandwidth channels
– analogue or digital transmission or both

In principle all class 2 capabilities can be supported on a single class 2 channel. For practical reasons however, class 2 home control systems may contain a separate channel or use a separate medium to support class 1 capabilities.

2.25
home control system class 3
home control system with class 2 transport capabilities plus:

– switched high quality sound and video transfer and high speed data transfer

NOTE These capabilities are typically provided by a class 2 system enhanced with:

– multiple switched high bandwidth channels
– analogue or digital transmission or both

In principle all class 3 capabilities can be supported on a single class 3 channel. For practical reasons however, class 3 home control systems may contain separate channels or use separate media to support class 1 and 2 capabilities.

2.26
home electronic system, HES
a home control system that conforms to the HES standards. There are three classes of HESs corresponding to the classes of home control systems

2.27
home network
internal network for digital and analogue information transport in home or business premises of similar complexity, providing defined access points and using any medium in any topology

2.28
information channel
a communication channel that is established between two or more entities for the primary purpose of exchange of information other than HES control and monitoring messages. Examples of such information are audio or video data, FAX data and analogue or digital speech signals

2.29
interconnectivity
ability of devices to be connected to a shared transmission medium by proper specification of mechanical, electrical and functional (lower layer protocol) characteristics

2.30
interface
shared boundary between two implementations of functions belonging to one or more functional groupings

2.31
interoperability
ability of devices to exchange commands via the higher layers resulting in meaningful actions. This includes aspects of the application domain which by definition is beyond the OSI domain

2.32
isolating functions
functions providing safety isolation between a device and an NAU

2.33
local application process
the part of an application process within a device that is not accessible through a communication network. It is located within the user domain and therefore may also be called the local user process

2.34
medium attachment point
physical connection point to a medium

2.35
medium interface, MI
interface placed at the medium attachment point, Reference Point A, which connects a device or a NAU directly to the transmission medium. Mechanical, electrical, functional and procedural characteristics are not provided in the HES standards

2.36
network access point
connection point giving access to a home network

2.37
network access unit, NAU
physical implementation of functions belonging to one or more functional groupings providing access to a home network and its transmission medium including the necessary functions for the particular implementation, for example contention control. It has one NSAP, and can be uniquely identified by one or more network addresses

2.38
network powered device, NPD
device that derives its power from the network

2.39
network segment
part of a network that is within the domain of a single link layer

2.40
object
set of data with associated functions applicable to it. An HES-object can be implemented in various ways

2.41
off state
state in which an SI device is not performing its intrinsic function

2.42
on state
state in which an SI device is performing its intrinsic function

2.43
packet-switched transmission
transmission that uses communication bandwidth in bursts. An entity transmitting data using packet-switched transmission organises the data in discrete "packets". Typically, two or more entities using packet-switched transmission share a communication channel. A protocol is required to resolve contention between transmitting entities to allow the orderly interleaving of packets from different entities

2.44
plug compatibility
the combined capability of interoperability and interconnection. It usually implies that a particular interface is claimed for a particular purpose to the extent that showing a certain interface implies interworking capabilities

2.45
process interface
any interface between devices and the network, placed above layer 7 in the OSI reference model, in a home control system

NOTE Examples of process interfaces are: one bit interfaces, parallel interfaces, and analogue interfaces.

2.46
process interface adaptation
process of adapting a device or an NAU to a process interface

2.47
reference model
model that describes the general principles of interconnections in a system and the network architecture resulting from those principles

2.48
repeater
unit that amplifies and regenerates signals to extend the range of transmissions between medium attachment points or to interconnect two network segments that use the same protocols

2.49
segmentation
function performed by an (N)-entity to map one (N)-SDU into multiple (N)-DPUs. It is the reverse function to reassembling

2.50
self-powered device, SPD
device which derives its power from other sources than the network

2.51
SI adaptation
process of adapting a device or an NAU to the SI

2.52
SI cable connector
standardized connector on an SI cable for connecting an SI device to an SI NAU

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

2.53
SI connection
connection point between an SI cable (where applicable) and an SI device

2.54
SI connector
connector on an SI NAU for connecting an SI device to an SI NAU

NOTE The SI connector is normally mounted in the wall.

2.55
SI control signal
signal transmitted via an SI NAU to an SI device to set the state of the device

2.56
SI device
device supporting and offering the SI

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

2.57
SI device connector
optional connector on an SI device for connection of an SI cable. The cable may instead be permanently attached to the device

2.58
SI dynamic monitor signal
one of two forms of the SI monitor signal, characterized by continuously switching between high and low signal levels for the on state

2.59
SI monitor signal
signal indicating the state of an SI device transmitted from the device to the SI NAU

2.60
SI network access unit
NAU supporting and offering the SI

NOTE If the context makes it clear that an NAU is an SI NAU, SI will normally be omitted from the term.

2.61
SI static monitor signal
one of two forms of the SI monitor signal, characterized by high signal state during the device on state, and low signal state during the device off state

2.62
SI-cable
cable connecting an SI device to an SI NAU

NOTE 1 The SI connector on the NAU is normally mounted in the wall.

NOTE 2 On the NAU end the SI cable has a connector; on the device end it could have a connector or be permanently attached to the device.

2.63
SI conductor
conductor connecting an SI NAU and an SI device

2.64
simple interface, SI
process interface, to be used for and by simple devices such as actuators and sensors, within a HES. The SI offers only one/zero commands and accepts only one/zero data entries. The specification of the SI includes the necessary mechanical, electrical, functional and procedural characteristics of the interface

2.65
standardized process interface, SPI
any process interface standardized by ISO/IEC

2.66
topology
structure of the communication paths between the medium attachment points. Examples of topologies are bus, ring, star, tree

2.67
transmission medium
a physical medium that conveys signals. Often referred to as medium

2.68
UI adaptation
process of adapting a device or an NAU to the UI

2.69
UI cable
cable connecting a UI device to a UI NAU. The UI connector on the NAU is normally mounted in the wall

NOTE The NAU end of the UI cable has a standardized connector; on the device end it could have a connector or be permanently attached to the device.

2.70
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.

2.71
UI cable plug housing, UI CPH
connector housing for the NAU end of the UI cable

2.72
UI connector
connector on a UI NAU for connecting a UI device to a UI NAU

NOTE The UI connector is normally mounted in the wall.

2.73
UI device
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.

2.74
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

2.75
UI network access unit
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.

2.76
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

2.77
user domain
that part of an HES above layer 7

2.78
user element
the aspect of a device application process that interfaces to layer 7 of a communications protocol stack

2.79
user process
that part of a device application process belonging to the real system environment, that is the user domain