



BSI Standards Publication

## Smart television

---

Part 1: Conceptual model for smart television

## National foreword

This Published Document is the UK implementation of IEC TR 63122-1:2019.

The UK participation in its preparation was entrusted to Technical Committee EPL/100, Audio-visual equipment.

A list of organizations represented on this committee can be obtained on request to its secretary.

This publication does not purport to include all the necessary provisions of a contract. Users are responsible for its correct application.

© The British Standards Institution 2020  
Published by BSI Standards Limited 2020

ISBN 978 0 580 99229 2

ICS 33.160.25

**Compliance with a British Standard cannot confer immunity from legal obligations.**

This Published Document was published under the authority of the Standards Policy and Strategy Committee on 31 January 2020.

### Amendments/corrigenda issued since publication

| Date | Text affected |
|------|---------------|
|------|---------------|

---



# IEC TR 63122-1

Edition 1.0 2019-12

## TECHNICAL REPORT



---

**Smart television –  
Part 1: Conceptual model for smart television**

INTERNATIONAL  
ELECTROTECHNICAL  
COMMISSION

---

ICS 33.160.25

ISBN 978-2-8322-7694-5

**Warning! Make sure that you obtained this publication from an authorized distributor.**

## CONTENTS

|  |    |
|--|----|
| FOREWORD.....  | 4  |
| INTRODUCTION.....  | 6  |
| 1 Scope.....   | 7  |
| 2 Normative references .....   | 7  |
| 3 Terms and definitions .....  | 7  |
| 4 General features.....  | 8  |
| 4.1 Framework of smart television system.....  | 8  |
| 4.2 Smart television terminal.....   | 10 |
| 4.2.1 Hardware.....  | 10 |
| 4.2.2 Software .....   | 10 |
| 4.3 Characteristics.....   | 11 |
| 4.3.1 Human-machine interaction .....  | 11 |
| 4.3.2 Multi-screen interaction .....   | 12 |
| 4.3.3 Security mechanism .....   | 12 |
| 5 Application scenarios of smart television .....                                      | 14 |
| 5.1 Digital TV broadcast .....   | 14 |
| 5.1.1 Digital TV .....   | 14 |
| 5.1.2 EPG .....  | 14 |
| 5.1.3 HbbTV .....  | 14 |
| 5.2 Internet-based application.....  | 14 |
| 5.2.1 General .....  | 14 |
| 5.2.2 Daily life information .....   | 14 |
| 5.2.3 Online audio/video service.....  | 15 |
| 5.2.4 E-commerce .....   | 15 |
| 5.2.5 Social application .....   | 15 |
| 5.2.6 Video communication service.....   | 15 |
| 5.2.7 Online information search.....   | 15 |
| 5.2.8 Online education .....   | 15 |
| 5.2.9 Cloud storage .....  | 15 |
| 5.2.10 Community living service .....  | 15 |
| 5.2.11 Health service.....   | 15 |
| 5.2.12 Smart home service.....   | 16 |
| 5.2.13 Games.....  | 16 |
| 5.3 Local application.....   | 16 |
| 5.4 Application store.....   | 16 |
| 5.4.1 Function description .....   | 16 |
| 5.4.2 Cloud application-management system.....   | 16 |
| 5.4.3 Terminal application management software .....                                   | 17 |
| Annex A (informative) Comparative study on existing smart television technologies..... | 18 |
| Annex B (informative) Essential features .....   | 20 |
| B.1 General.....   | 20 |
| B.2 Connection .....   | 20 |
| B.3 N-screen technology .....  | 20 |
| B.3.1 Wi-Fi Direct™ .....  | 20 |
| B.3.2 DLNA.....  | 21 |
| B.4 Human-machine interaction technology.....  | 21 |

|  |    |
|--|----|
| Annex C (informative) Smart television platforms and solutions ..... | 22 |
| C.1 HbbTV .....  | 22 |
| C.2 Android TV .....   | 23 |
| C.3 tvOS .....   | 23 |
| C.4 Open webOS .....   | 24 |
| C.5 Tizen .....  | 24 |
| C.6 Linux (embedded operation system).....                           | 24 |
| C.7 Apple TV.....  | 25 |
| Annex D (informative) Media profile .....                            | 26 |
| Bibliography.....  | 27 |
| Figure 1 – Block diagram of smart television system .....            | 9  |
| Figure 2 – Block diagram of smart television terminal .....          | 11 |

## INTERNATIONAL ELECTROTECHNICAL COMMISSION

## SMART TELEVISION –

## Part 1: Conceptual model for smart television

## FOREWORD

- 1) The International Electrotechnical Commission (IEC) is a worldwide organization for standardization comprising all national electrotechnical committees (IEC National Committees). The object of IEC is to promote international co-operation on all questions concerning standardization in the electrical and electronic fields. To this end and in addition to other activities, IEC publishes International Standards, Technical Specifications, Technical Reports, Publicly Available Specifications (PAS) and Guides (hereafter referred to as "IEC Publications"). Their preparation is entrusted to technical committees; any IEC National Committee interested in the subject dealt with may participate in this preparatory work. International, governmental and non-governmental organizations liaising with the IEC also participate in this preparation. IEC collaborates closely with the International Organization for Standardization (ISO) in accordance with conditions determined by agreement between the two organizations.
- 2) The formal decisions or agreements of IEC on technical matters express, as nearly as possible, an international consensus of opinion on the relevant subjects since each technical committee has representation from all interested IEC National Committees.
- 3) IEC Publications have the form of recommendations for international use and are accepted by IEC National Committees in that sense. While all reasonable efforts are made to ensure that the technical content of IEC Publications is accurate, IEC cannot be held responsible for the way in which they are used or for any misinterpretation by any end user.
- 4) In order to promote international uniformity, IEC National Committees undertake to apply IEC Publications transparently to the maximum extent possible in their national and regional publications. Any divergence between any IEC Publication and the corresponding national or regional publication shall be clearly indicated in the latter.
- 5) IEC itself does not provide any attestation of conformity. Independent certification bodies provide conformity assessment services and, in some areas, access to IEC marks of conformity. IEC is not responsible for any services carried out by independent certification bodies.
- 6) All users should ensure that they have the latest edition of this publication.
- 7) No liability shall attach to IEC or its directors, employees, servants or agents including individual experts and members of its technical committees and IEC National Committees 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, use of, or reliance upon, this IEC Publication or any other IEC Publications.
- 8) 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.
- 9) Attention is drawn to the possibility that some of the elements of this IEC Publication may be the subject of patent rights. IEC shall not be held responsible for identifying any or all such patent rights.

The main task of IEC technical committees is to prepare International Standards. However, a technical committee may propose the publication of a technical report when it has collected data of a different kind from that which is normally published as an International Standard, for example "state of the art".

IEC TR 63122-1, which is a technical report, has been prepared by subcommittee TA 1: terminals for audio, video and data services and contents, of IEC technical committee 100: Audio, video and multimedia systems and equipment.

The text of this technical report is based on the following documents:

|               |                  |
|---------------|------------------|
| Enquiry draft | Report on voting |
| 100/2903/DTR  | 100/3053/RVC     |

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

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

A list of all parts in the IEC 63122 series, published under the general title *Smart television*, can be found on the IEC website.

The committee has decided that the contents of this document will remain unchanged until the stability date indicated on the IEC website under "<http://webstore.iec.ch>" in the data related to the specific document. At this date, the document will be

- reconfirmed,
- withdrawn,
- replaced by a revised edition, or
- amended.

**IMPORTANT – The 'colour inside' logo on the cover page of this publication indicates that it contains colours which are considered to be useful for the correct understanding of its contents. Users should therefore print this document using a colour printer.**

## INTRODUCTION

This part of IEC 63122 discusses the background of cloud computing, the Internet, the mobile Internet industry, the principle of open innovation, the vertical integration of the industry chain, technology and encourages the digital TV (television) industry to seize the opportunity to upgrade and strengthen innovation in smart television technology. The innovations of business models and institutional mechanisms will be explored, and we will explain how acceleration is needed to broaden the application market and put forward the concept of smart television models and standardization needs.

The reception of digital TV and high-definition broadcasting in the home has recently been well established for various areas. Internet TV and delivery of multimedia content to the user at home, via the Internet, are also becoming increasingly common.

Smart television systems are intended to extend the reach of multimedia content to the TV set in a seamless, viewer-friendly manner. The viewer can more conveniently access both broadcast digital content and Internet multimedia content on a TV set using a single user interface device and a single on-screen interface.

There are three major key factors leading smart television development. Lifestyle changes from the user side, the building of network infrastructure according to the rapid development of wired and wireless networks, and the emergence of TV alternatives.

An individualized lifestyle accelerates personalization and customization of contents, and the experience from other smart electronic devices drives the user to long for the smart television as the core of entertainment at home.

The rapid development of high-speed Internet access and the emergence of home network techniques assigning an IP address to electronic devices will make TV smarter.

In addition, the market requires a change from TV to smart television because of the emergence of TV alternatives, such as the tablet, the smartphone and the media player.

## SMART TELEVISION –

### Part 1: Conceptual model for smart television

#### 1 Scope

The focus of this part of IEC 63122 is the conceptual definition of smart television, basic features, use cases and current technologies based on applications and requirements. They make it clear where further existing standards can be used and highlight where work on standards is needed.

In addition, this document was developed taking into account ISO/IEC Guide 71. The objective of this document is to highlight potential areas for standardisation for smart televisions.

#### 2 Normative references

There are no normative references in this document.

#### 3 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

ISO and IEC maintain terminological databases for use in standardization at the following addresses:

- IEC Electropedia: available at <http://www.electropedia.org/>
- ISO Online browsing platform: available at <http://www.iso.org/obp>

##### 3.1

##### **smart television system**

television system consisting of a smart television service platform, transmission network and smart television terminal

##### 3.2

##### **smart television service platform**

service platform that is capable of providing smart television terminal with such applications or services as digital TV, broadcast or Internet service

Note 1 to entry: The services could be VOD, catch-up, games, web searches, interactive advertising, personalization, voting, social networking, etc.

##### 3.3

##### **transmission network**

network for interactive data transmission in smart television systems, which includes the home network (family local network), radio and television broadcasting network, the Internet, and other networks (i.e. accident or secure private network)

##### 3.4

##### **smart television terminal**

digital television set (TV set and set-top box) with integrated Internet capability and an operating system, which can use a variety of contents through services by using a convenient user interface/experience

Note 1 to entry: Usually, smart televisions allow the user to install and run more advanced applications or plug-ins/add-ons based on a specific platform.