

---

---

**Information technology — Media context  
and control —**

**Part 2:  
Control information**

*Technologies de l'information — Contrôle et contexte de supports —  
Partie 2: Informations de contrôle*

Withhold & MNR

Withdrawn



**COPYRIGHT PROTECTED DOCUMENT**

© ISO/IEC 2013

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 either ISO at the address below or ISO's member body in the country of the requester.

ISO copyright office  
Case postale 56 • CH-1211 Geneva 20  
Tel. + 41 22 749 01 11  
Fax + 41 22 749 09 47  
E-mail [copyright@iso.org](mailto:copyright@iso.org)  
Web [www.iso.org](http://www.iso.org)

Published in Switzerland

# Contents

Page

Foreword .....	v
Introduction.....	vi
<b>1 Scope .....</b>	<b>1</b>
<b>2 Normative references .....</b>	<b>1</b>
<b>3 Terms, definitions, and abbreviated terms .....</b>	<b>2</b>
<b>3.1 Abbreviated terms .....</b>	<b>2</b>
<b>4 Control information description language.....</b>	<b>2</b>
<b>4.1 Introduction.....</b>	<b>2</b>
<b>4.2 Schema wrapper conventions .....</b>	<b>2</b>
<b>4.3 Mnemonics for binary representations .....</b>	<b>3</b>
<b>4.4 Common header for binary representations .....</b>	<b>3</b>
<b>4.5 Root element and top-level tools.....</b>	<b>3</b>
<b>4.6 Sensory device capability description .....</b>	<b>18</b>
<b>4.7 Sensor capability description .....</b>	<b>21</b>
<b>4.8 User's sensory preference description.....</b>	<b>28</b>
<b>4.9 Sensor adaptation preference description .....</b>	<b>30</b>
<b>5 Device capability description vocabulary.....</b>	<b>35</b>
<b>5.1 Introduction.....</b>	<b>35</b>
<b>5.2 Schema wrapper conventions .....</b>	<b>35</b>
<b>5.3 Light capability type.....</b>	<b>35</b>
<b>5.4 Flash capability type .....</b>	<b>38</b>
<b>5.5 Heating capability type .....</b>	<b>39</b>
<b>5.6 Cooling capability type .....</b>	<b>41</b>
<b>5.7 Wind capability type .....</b>	<b>43</b>
<b>5.8 Vibration capability type.....</b>	<b>45</b>
<b>5.9 Scent capability type.....</b>	<b>47</b>
<b>5.10 Fog capability type .....</b>	<b>50</b>
<b>5.11 Sprayer capability type.....</b>	<b>52</b>
<b>5.12 Color correction capability type .....</b>	<b>54</b>
<b>5.13 Tactile capability type .....</b>	<b>55</b>
<b>5.14 Kinesthetic capability type .....</b>	<b>61</b>
<b>5.15 RigidBodyMotion capability type.....</b>	<b>68</b>
<b>5.16 Mobile device position capability type.....</b>	<b>83</b>
<b>6 Sensor capability description vocabulary .....</b>	<b>88</b>
<b>6.1 Introduction.....</b>	<b>88</b>
<b>6.2 Schema wrapper conventions .....</b>	<b>88</b>
<b>6.3 Light sensor capability type.....</b>	<b>88</b>
<b>6.4 Ambient noise sensor capability type.....</b>	<b>90</b>
<b>6.5 Temperature sensor capability type.....</b>	<b>92</b>
<b>6.6 Humidity sensor capability type .....</b>	<b>93</b>
<b>6.7 Distance sensor capability type.....</b>	<b>95</b>
<b>6.8 Atmospheric pressure sensor capability type .....</b>	<b>96</b>
<b>6.9 Position sensor capability type .....</b>	<b>97</b>
<b>6.10 Velocity sensor capability type.....</b>	<b>100</b>
<b>6.11 Acceleration sensor capability type .....</b>	<b>101</b>
<b>6.12 Orientation sensor capability type .....</b>	<b>102</b>
<b>6.13 Angular velocity sensor capability type.....</b>	<b>104</b>
<b>6.14 Angular acceleration sensor capability type.....</b>	<b>105</b>
<b>6.15 Force sensor capability type.....</b>	<b>106</b>

6.16	Torque sensor capability type.....	107
6.17	Pressure sensor capability type.....	108
6.18	Motion sensor capability type .....	109
6.19	Intelligent camera capability type .....	112
6.20	Bend sensor capability type .....	117
6.21	Gas sensor capability type .....	120
6.22	Dust sensor capability type .....	122
6.23	Multi interaction point sensor capability type .....	123
6.24	Gaze tracking sensor capability type .....	124
6.25	Global position sensor capability type.....	127
6.26	Altitude sensor capability type.....	130
6.27	Weather sensor capability type.....	132
7	User's sensory preference vocabulary .....	135
7.1	Introduction .....	135
7.2	Schema wrapper conventions.....	135
7.3	Light preference type .....	135
7.4	Flash preference type.....	137
7.5	Heating preference type.....	139
7.6	Cooling preference type.....	140
7.7	Wind preference type .....	142
7.8	Vibration preference type .....	144
7.9	Scent preference type .....	145
7.10	Fog preference type .....	147
7.11	Spraying preference type.....	149
7.12	Color correction preference type .....	151
7.13	Tactile preference type.....	152
7.14	Kinesthetic preference type.....	155
7.15	RigidBodyMotion preference type .....	157
8	Sensor adaptation preference vocabulary.....	171
8.1	Introduction .....	171
8.2	Schema wrapper conventions.....	172
8.3	Light sensor adaptation preference type .....	172
8.4	Ambient noise sensor adaptation preference type .....	174
8.5	Temperature sensor adaptation preference type .....	175
8.6	Humidity sensor adaptation preference type .....	176
8.7	Distance sensor adaptation preference type.....	177
8.8	Atmospheric pressure sensor adaptation preference type .....	178
8.9	Position sensor adaptation preference type.....	179
8.10	Velocity sensor adaptation preference type .....	181
8.11	Acceleration sensor adaptation preference type .....	182
8.12	Orientation sensor adaptation preference type.....	183
8.13	Angular velocity sensor adaptation preference type.....	185
8.14	Angular acceleration sensor adaptation preference type .....	186
8.15	Force sensor adaptation preference type .....	187
8.16	Torque sensor adaptation preference type.....	188
8.17	Pressure sensor adaptation preference type .....	189
8.18	Motion sensor adaptation preference type .....	190
8.19	Intelligent camera sensor adaptation preference type .....	193
<b>Annex A (normative) Classification Schemes.....</b>		<b>198</b>
<b>Annex B (informative) Schema documents .....</b>		<b>200</b>
<b>Annex C (informative) Patent Statements.....</b>		<b>201</b>
<b>Bibliography.....</b>		<b>202</b>

## Foreword

ISO (the International Organization for Standardization) and IEC (the 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. In the field of information technology, ISO and IEC have established a joint technical committee, ISO/IEC JTC 1.

International Standards are drafted in accordance with the rules given in the ISO/IEC Directives, Part 2.

The main task of the joint technical committee is to prepare International Standards. 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.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. ISO and IEC shall not be held responsible for identifying any or all such patent rights.

ISO/IEC 23005-2 was prepared by Joint Technical Committee ISO/IEC JTC 1, *Information technology*, Subcommittee SC 29, *Coding of audio, picture, multimedia and hypermedia information*.

This second edition cancels and replaces the first edition (ISO/IEC 23005-2:2011), which has been technically revised.

ISO/IEC 23005 consists of the following parts, under the general title *Information technology — Media context and control*:

- *Part 1: Architecture*
- *Part 2: Control information*
- *Part 3: Sensory information*
- *Part 4: Virtual world object characteristics*
- *Part 5: Data formats for interaction devices*
- *Part 6: Common types and tools*
- *Part 7: Conformance and reference software*

## Introduction

ISO/IEC 23005 (MPEG-V) provides an architecture and specifies associated information representations to enable interoperability between virtual worlds, e.g. digital content provider of a virtual world, gaming (serious), simulation, DVD, and the real world, e.g. sensors, actuators, vision and rendering, robotics (e.g. for revalidation), (support for) independent living, social and welfare systems, banking, insurance, travel, real estate, rights management and many others.

Virtual worlds (often referred to as 3D3C for 3D visualization and navigation and the 3Cs of Community, Creation and Commerce) integrate existing and emerging media technologies (e.g. instant messaging, video, 3D, VR, AI, chat, voice, etc.) that allow for the support of existing and the development of new kinds of social networks. The emergence of virtual worlds as platforms for social networking is recognized by businesses as an important issue for at least two reasons:

- 1) it offers the power to reshape the way companies interact with their environments (markets, customers, suppliers, creators, stakeholders, etc.) in a fashion comparable to the Internet;
- 2) it allows for the development of new (breakthrough) business models, services, applications and devices.

Each virtual world, however, has a different culture and audience making use of these specific worlds for a variety of reasons. These differences in existing Metaverses permit users to have unique experiences. Resistance to real-world commercial encroachment still exists in many virtual worlds, where users primarily seek an escape from real life. Hence, marketers should get to know a virtual world beforehand and the rules that govern each individual universe.

Although realistic experiences have been achieved via devices such as 3D audio/visual devices, it is hard to realize sensory effects only with presentation of audiovisual contents. The addition of sensory effects leads to even more realistic experiences in the consumption of audiovisual contents. This will lead to the application of new media for enhanced experiences of users in a more realistic sense.

Such new media will benefit from the standardization of control and sensory information which consists of sensory effect metadata, sensory device capabilities/commands, user sensory preferences, and various delivery formats. The MPEG-V architecture can be applicable for various business models for which audiovisual contents can be associated with sensory effects that need to be rendered on appropriate sensory devices.

This part of ISO/IEC 23005 contains the tools of the control information for the media. It addresses the normative aspects of the control information including device capability description, user preference information, and also illustrates some non-normative examples.

The International Organization for Standardization (ISO) and the International Electrotechnical Commission (IEC) draw attention to the fact that it is claimed that compliance with this document may involve the use of patents.

ISO and the IEC take no position concerning the evidence, validity and scope of these patent rights.

The holders of these patent rights have assured ISO and the IEC that they are willing to negotiate licences under reasonable and non-discriminatory terms and conditions with applicants throughout the world. In this respect, the statements of the holders of these patent rights are registered with ISO and the IEC. Information may be obtained from the companies listed in Annex B.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights other than those identified in Annex B. ISO and the IEC shall not be held responsible for identifying any or all such patent rights.

# Information technology — Media context and control —

## Part 2: Control information

### 1 Scope

This part of ISO/IEC 23005 specifies syntax and semantics of the tools required to provide interoperability in controlling devices in real as well as virtual worlds. In Figure 1, the scope of this part of ISO/IEC 23005 with tools defined in this part of ISO/IEC 23005 is shown. The adaptation engine (RV or VR engine), which is not within the scope of standardization, takes six inputs [sensory effects (SE), user's sensory effect preferences (USEP), sensory devices capabilities (SDC), sensor capability (SC), sensor adaptation preferences (SAP), and sensed information (SI)] and outputs sensory devices commands (SDCmd) and/or sensed information (SI) to control the devices in real world or virtual world objects. It is applicable to the interfaces between the adaptation engine and the capability descriptions of actuators/sensors in the real world, the user's sensory preference information, which characterize devices and users, and the sensor adaptation preferences information, which characterize sensors and users, so that appropriate information to control devices (actuators and sensors) can be generated. In other words, user's sensory preferences, sensory device capabilities, sensor adaptation preferences, and sensor capabilities are within the scope of this part of ISO/IEC 23005.

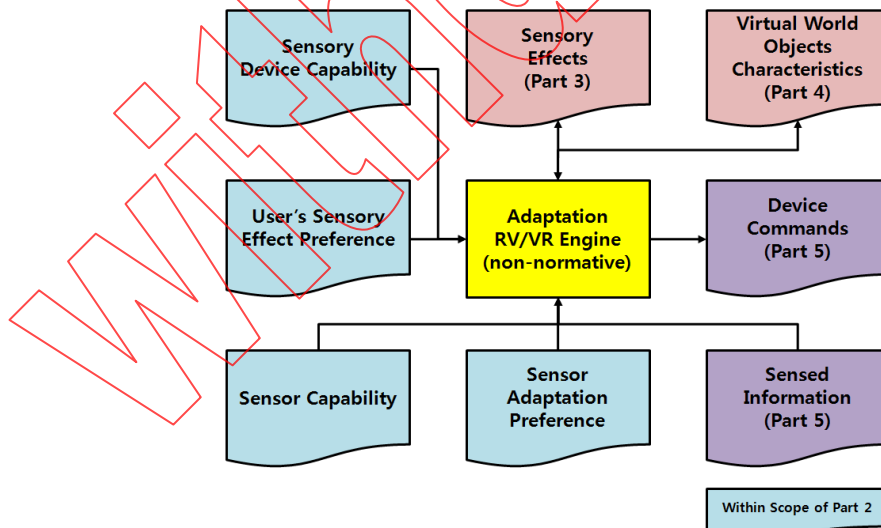


Figure 1 — Scope of the Control Information

### 2 Normative references

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

ISO/IEC 15938-5:2003, *Information technology — Multimedia content description interface — Part 5: Multimedia description schemes*

ISO/IEC 23005-6, *Information technology — Media context and control — Part 6: Common types and tools*

ISO/IEC 21000-7, *Information technology — Multimedia framework (MPEG-21) — Part 7: Digital Item Adaptation*

Withdrawn