INTERNATIONAL STANDARD

ISO/IEC 23005-2

Second edition
2013-04-01

Information technology — Media context and control —

Part 2: Control information

Technologies de l'information — Contrôle et contexte de supports —

Partie 2: Informations de contrôle

IECNORM.COM : Click to view the full PDF of ISO/IEC 23005-2:2013

Reference number
ISO/IEC 23005-2:2013(E)

© ISO/IEC 2013

IECNORM.COM : Click to view the full PDF of ISO/IEC 23005-2:2013

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
Web www.iso.org

Published in Switzerland

 © ISO/IEC 2013 – All rights reserved

Contents

Page

Foreword v

Introduction vi

1 Scope 1

2 Normative references 1

3 Terms, definitions, and abbreviated terms 2
3.1 Abbreviated terms 2

4 Control information description language 2
4.1 Introduction 2
4.2 Schema wrapper conventions 2
4.3 Mnemonics for binary representations 3
4.4 Common header for binary representations 3
4.5 Root element and top-level tools 3
4.6 Sensory device capability description 18
4.7 Sensor capability description 21
4.8 User's sensory preference description 28
4.9 Sensor adaptation preference description 30

5 Device capability description vocabulary 35
5.1 Introduction 35
5.2 Schema wrapper conventions 35
5.3 Light capability type 35
5.4 Flash capability type 38
5.5 Heating capability type 39
5.6 Cooling capability type 41
5.7 Wind capability type 43
5.8 Vibration capability type 45
5.9 Scent capability type 47
5.10 Fog capability type 50
5.11 Sprayer capability type 52
5.12 Color correction capability type 54
5.13 Tactile capability type 55
5.14 Kinesthetic capability type 61
5.15 RigidBodyMotion capability type 68
5.16 Mobile device position capability type 83

6 Sensor capability description vocabulary 88
6.1 Introduction 88
6.2 Schema wrapper conventions 88
6.3 Light sensor capability type 88
6.4 Ambient noise sensor capability type 90
6.5 Temperature sensor capability type 92
6.6 Humidity sensor capability type 93
6.7 Distance sensor capability type 95
6.8 Atmospheric pressure sensor capability type 96
6.9 Position sensor capability type 97
6.10 Velocity sensor capability type 100
6.11 Acceleration sensor capability type 101
6.12 Orientation sensor capability type 102
6.13 Angular velocity sensor capability type 104
6.14 Angular acceleration sensor capability type 105
6.15 Force sensor capability type 106

IECNORM.COM : Click to view the full PDF of ISO/IEC 23005-2:2013

© ISO/IEC 2013 – All rights reserved

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

Annex A (normative) **Classification Schemes** 198

Annex B (informative) **Schema documents** 200

Annex C (informative) **Patent Statements** 201

Bibliography 202

IECNORM.COM : Click to view the full PDF of ISO/IEC 23005-2:2013

© ISO/IEC 2013 – All rights reserved

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*

IECNORM.COM : Click to view the full PDF of ISO/IEC 23005-2:2013

© ISO/IEC 2013 – All rights reserved

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.

IECNORM.COM : Click to view the full PDF of ISO/IEC 23005-2:2013

© ISO/IEC 2013 – All rights reserved

Information technology — Media context and control —

Part 2:
Control information

IECNORM.COM : Click to view the full PDF of ISO/IEC 23005-2:2013

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.

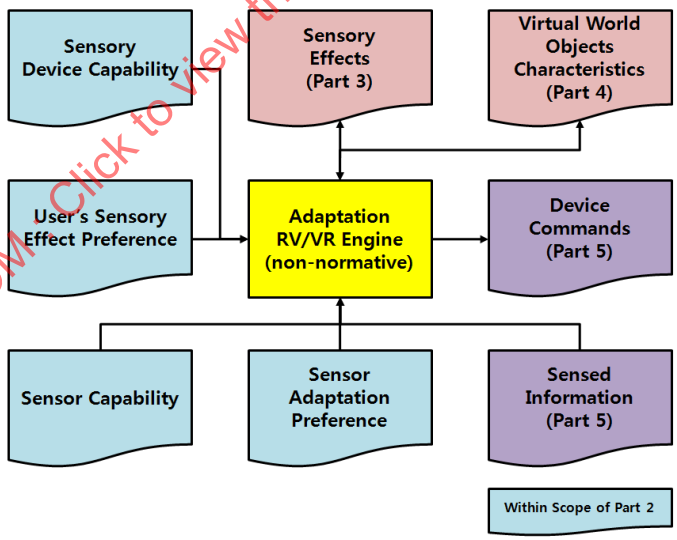

Figure 1 — Scope of the Control Information

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 2013 – All rights reserved

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*

3 Terms, definitions, and abbreviated terms

For the purposes of this document, the terms and definitions given in ISO/IEC 23005-6 apply.

3.1 Abbreviated terms

For the purposes of this document, the following abbreviated terms apply.

DIA: Digital Item Adaptation (see ISO/IEC 21000-7)

MPEG-21: multimedia framework (ISO/IEC 21000-5)

XML: Extensible Markup Language (see XML)

4 Control information description language

4.1 Introduction

This Clause describes basic structure of the tools in this part of ISO/IEC 23005 in the form of control information description language including the schema wrapper conventions, basic data types, root element, and top-level elements.

4.2 Schema wrapper conventions

The Syntax defined in this part of ISO/IEC 23005 assumes the following Schema Wrapper to form a valid XML schema document.

```
<schema xmlns="http://www.w3.org/2001/XMLSchema"
xmlns:mpeg7="urn:mpeg:mpeg7:schema:2004" xmlns:dia="urn:mpeg:mpeg21:2003:01-DIA-
NS" xmlns:mpegvct="urn:mpeg:mpeg-v:2012:01-CT-NS" xmlns:cidl="urn:mpeg:mpeg-
v:2012:01-CIDL-NS" xmlns:dcdv="urn:mpeg:mpeg-v:2012:01-DCDV-NS"
xmlns:scdv="urn:mpeg:mpeg-v:2012:01-SCDV-NS" xmlns:sepv="urn:mpeg:mpeg-v:2012:01-
SEPV-NS" xmlns:sapv="urn:mpeg:mpeg-v:2012:01-SAPV-NS"
targetNamespace="urn:mpeg:mpeg-v:2012:01-CIDL-NS" elementFormDefault="qualified"
attributeFormDefault="unqualified" version="ISO/IEC 23005-2" id="MPEG-V-
CIDL.xsd">
   <import namespace="urn:mpeg:mpeg7:schema:2004"
schemaLocation="http://standards.iso.org/ittf/PubliclyAvailableStandards/MPEG-
7_schema_files/mpeg7-v2.xsd"/>
   <import namespace="urn:mpeg:mpeg21:2003:01-DIA-NS"
schemaLocation="http://standards.iso.org/ittf/PubliclyAvailableStandards/MPEG-
21_schema_files/dia-2nd/UED-2nd.xsd"/>
   <import namespace="urn:mpeg:mpeg-v:2012:01-CT-NS" schemaLocation="MPEG-V-
CT.xsd"/>
   <import namespace="urn:mpeg:mpeg-v:2012:01-DCDV-NS"
schemaLocation="DCDV.xsd"/>
```

IECNORM.COM : Click to view the full PDF of ISO/IEC 23005-2:2013

© ISO/IEC 2013 – All rights reserved

```
    <import namespace="urn:mpeg:mpeg-v:2012:01-SCDV-NS"
schemaLocation="SCDV.xsd"/>
    <import namespace="urn:mpeg:mpeg-v:2012:01-SEPV-NS"
schemaLocation="SEPV.xsd"/>
    <import namespace="urn:mpeg:mpeg-v:2012:01-SAPV-NS"
schemaLocation="SAPV.xsd"/>
```

Additionally, the following line should be appended to the resulting schema document in order to obtain a well-formed XML document.

```
</schema>
```

4.3 Mnemonics for binary representations

The mnemonics are defined in 4.2 of ISO/IEC 23005-6.

4.4 Common header for binary representations

The common header is defined in 4.3 of ISO/IEC 23005-6.

4.5 Root element and top-level tools

4.5.1 Introduction

This Subclause specifies the root element and the top-level tools which can follow root element in control information. The root element is the only element which can appear as the topmost element when the control information specified in this part of ISO/IEC 23005 is instantiated. The top-level tools are defined as the elements which are allowed to appear as the topmost element within the root element.

4.5.2 XML representation syntax

```
<!-- ################################################ -->
<!--  Root Element                                    -->
<!-- ################################################ -->
<element name="ControlInfo" type="cidl:ControlInfoType"/>

<complexType name="ControlInfoType">
    <sequence>
        <element name="SensoryDeviceCapabilityList"
            type="cidl:SensoryDeviceCapabilityListType" minOccurs="0"/>
        <element name="SensorDeviceCapabilityList"
            type="cidl:SensorDeviceCapabilityListType" minOccurs="0"/>
        <element name="UserSensoryPreferenceList"
            type="cidl:UserSensoryPreferenceListType" minOccurs="0"/>
        <element name="SensorAdaptationPreferenceList"
            type="cidl:SensorAdaptationPreferenceListType" minOccurs="0"/>
    </sequence>
</complexType>

<complexType name="SensoryDeviceCapabilityListType">
    <sequence>
        <element name="SensoryDeviceCapability"
            type="cidl:SensoryDeviceCapabilityBaseType" maxOccurs="unbounded"/>
```

IECNORM.COM : Click to view the full PDF of ISO/IEC 23005-2:2013

© ISO/IEC 2013 – All rights reserved

```
    </sequence>
</complexType>

<complexType name="SensorDeviceCapabilityListType">
    <sequence>
        <element name="SensorDeviceCapability"
            type="cidl:SensorCapabilityBaseType" maxOccurs="unbounded"/>
    </sequence>
</complexType>

<complexType name="UserSensoryPreferenceListType">
    <sequence>
        <element name="USPreference" type="cidl:UserSensoryPreferenceBaseType"
            maxOccurs="unbounded"/>
    </sequence>
</complexType>

<complexType name="SensorAdaptationPreferenceListType">
    <sequence>
        <element name="SAPreference"
type="cidl:SensorAdaptationPreferenceBaseType" maxOccurs="unbounded"/>
    </sequence>
</complexType>
```

4.5.3 Binary representation syntax

ControlInfoType{	**(Number of bits)**	**(Mnemonic)**
SensoryDeviceCapabilityListFlag	1	bslbf
SensorDeviceCapabilityListFlag	1	bslbf
UserSensoryPreferenceListFlag	1	bslbf
SensorAdaptationPreferenceListFlag	1	bslbf
If (SensoryDeviceCapabilityListFlag) {		
SensoryDeviceCapabilityList		SensoryDeviceCapabilityListType
}		
If (SensorDeviceCapabilityListFlag) {		
SensorDeviceCapabilityList		SensorDeviceCapabilityListType
}		
If (UserSensoryPreferenceListFlag) {		
UserSensoryPreferenceList		UserSensoryPreferenceListType
}		

IECNORM.COM : Click to view the full PDF of ISO/IEC 23005-2:2013

© ISO/IEC 2013 – All rights reserved

ControlInfoType{	**(Number of bits)**	**(Mnemonic)**
If (SensorAdaptationPreferenceListFlag) {		
SensorAdaptationPreferenceList		SensorAdaptationPreferenceListType
}		
}		
SensoryDeviceCapabilityListType {		
NumOfSensoryDevCap	32	uimsbf
for(i=1;i<NumOfSensoryDevCap;i++){		
IndividualSensoryDevCapType	8	bslbf
SensoryDeviceCapability		SensoryDeviceCapabilityType specified by IndividualSensoryDevCapType
}		
}		
SensorDeviceCapabilityListType {		
NumOfSensorCap	32	uimsbf
for(i=1;i<NumOfSensorCap;i++){		
IndividualSensorCapType	8	bslbf
SensorCapability		SensorCapabilityType specified by IndividualSensorCapType
}		
}		
UserSensoryPreferenceListType {		
NumOfUserSensoryPref	32	uimsbf
for(i=1;i<NumOfUserSensoryPref;i++){		
IndividualUserSensoryPrefType	8	bslbf

IECNORM.COM : Click to view the full PDF of ISO/IEC 23005-2:2013

© ISO/IEC 2013 – All rights reserved

ControlInfoType{	**(Number of bits)**	**(Mnemonic)**
USPreference		USPreferenceType specified by IndividualUserSensoryPrefType
}		
}		
SensorAdaptationPreferenceListType {		
NumOfSensorAdaptationPref	32	uimsbf
for(i=1;i< NumOfSensorAdaptationPref;i++){		
IndividualSensorAdaptationPrefType	8	bslbf
SAPreference		SAPreferenceType specified by IndividualSensorAdaptationPrefType
}		
}		

4.5.4 Semantics

Semantics of the `ControlInfo` type:

Name	*Definition*
`ControlInfo`	The root element that serves as the topmost element in the control information description.
`SensoryDeviceCapabilityListFlag`	This field, which is only present in the binary representation, signals the presence of the activation attribute. A value of ”1” means the attribute shall be used and ”0” means the attribute shall not be used.
`SensorDeviceCapabilityListFlag`	This field, which is only present in the binary representation, signals the presence of the activation attribute. A value of ”1” means the attribute shall be used and ”0” means the attribute shall not be used.
`UserSensoryPreferenceListFlag`	This field, which is only present in the binary representation, signals the presence of the activation attribute. A value of ”1” means the attribute shall be used and ”0” means the attribute shall not be used.

IECNORM.COM : Click to view the full PDF of ISO/IEC 23005-2:2013

© ISO/IEC 2013 – All rights reserved

Name	*Definition*
SensorAdaptationPreferenceListFlag	This field, which is only present in the binary representation, signals the presence of the activation attribute. A value of ”1” means the attribute shall be used and ”0” means the attribute shall not be used.
ControlInfoType	The root type provides basic structure that the control information description should follow through the root element. This field, which is present in the binary representation, indicates the type of the ControlInfo element. There should be used at least one element among ControlInfoType.
SensoryDeviceCapabilityList	Optional wrapper element that serves as the placeholder for the list of sensory device capability descriptions.
SensorDeviceCapabilityList	Optional wrapper element that serves as the placeholder for the list of sensor device capability descriptions.
UserSensoryPreferenceList	Optional wrapper element that serves as the placeholder for the list of device user preference descriptions.
SensorAdaptationPreferenceList	Optional wrapper element that serves as the placeholder for the list of sensor device adaptation preference descriptions.
SensoryDeviceCapabilityListType	Wrapper element type which allows multiple occurrences of sensory device capability descriptions.
NumOfSensoryDevCap	This field, which is only present in the binary representation, specifies the number of SensoryDeviceCapability instances accommodated in the SensoryDeviceCapabilityList.
IndividualSensoryDevCapType	This field, which is only present in the binary representation, describes which SensoryDeviceCapability type shall be used. In the binary description, the following mapping table is used, Terms of Device / Binary representation for device type (8bits) Light device / 00000000 Flash device / 00000001 Heating device / 00000010 Cooling device / 00000011 Wind device / 00000100 Vibration device / 00000101

IECNORM.COM : Click to view the full PDF of ISO/IEC 23005-2:2013

© ISO/IEC 2013 – All rights reserved

Name	*Definition*
	Sprayer device: 00000110 Scent device: 00000111 Fog device: 00001000 Color correction device: 00001001 Rigid body motion device: 00001010 Tactile device: 00001011 Kinesthetic device: 00001100 Mobile device position: 00001101 Reserved: 00001110-11111111
`SensoryDeviceCapability`	Specifies single description of sensory device capability description. The list of single device capabilities are as follows

Terms of Device	Device capability type
Light device	`LightCapabilityType`
Flash device	`FlashCapabilityType`
Heating device	`HeatingCapabilityType`
Cooling device	`CoolingCapabilityType`
Wind device	`WindCapabilityType`
Vibration device	`VibrationCapabilityType`
Sprayer device	`SprayerCapabilityType`
Scent device	`ScentCapabilityType`
Fog device	`FogCapabilityType`
Color correction device	`ColorCorrectionCapabilityType`
Rigid body motion device	`RigidBodyMotionCapabilityType`
Tactile device	`TactileCapabilityType`
Kinesthetic device	`KinestheticCapabilityType`
Mobile device position	`MobileDevicePositionCapabilityType`

IECNORM.COM : Click to view the full PDF of ISO/IEC 23005-2:2013

© ISO/IEC 2013 – All rights reserved

Name	*Definition*
SensoryDeviceCapabilityBaseType	SensoryDeviceCapabilityBaseType shall extend dia:TeminalCapabilityBaseType as defined in ISO/IEC 21000-7 and provides a base abstract type for a subset of types defined as part of the sensory device capability metadata types.
SensorDeviceCapabilityListType	Wrapper element type which allows multiple occurrences of sensor device capability descriptions.
NumOfSensorCap	This field, which is only present in the binary representation, specifies the number of SensorCapability instances accommodated in the SensorCapabilityList.
IndividualSensorCapType	This field, which is only present in the binary representation, describes which SensorCapability type shall be used. In the binary description, the following mapping table is used,

Term of sensor capability	Binary representation for sensor type (8 bits)
Light sensor capability	00000000
Ambient noise sensor capability	00000001
Temperature sensor capability	00000010
Humidity sensor capability	00000011
Distance sensor capability	00000100
Atmospheric pressure Sensor capability	00000101
Position sensor capability	00000110
Velocity sensor capability	00000111
Acceleration sensor capability	00001000
Orientation sensor capability	00001001
Angular velocity sensor capability	00001010
Angular acceleration sensor capability	00001011
Force sensor capability	00001100
Torque sensor capability	00001101
Pressure sensor capability	00001110

IECNORM.COM : Click to view the full PDF of ISO/IEC 23005-2:2013

© ISO/IEC 2013 – All rights reserved

Name	*Definition*
	Motion sensor capability: 00001111 Intelligent camera sensor capability: 00010000 Bend sensor capability: 00010001 Gas sensor capability: 00010010 Dust sensor capability: 00010011 Multi interaction point sensor capability: 00010100 Gaze tracking sensor capability: 00010101 Global position sensor capability: 00010110 Altitude sensor capability: 00010111 Reserved: 00011000-11111111
`SensorDeviceCapability`	Specifies single description of sensor device capability description. The list of single commands are as follows, Term of Sensor — Sensor capability type Light sensor — `LightSensorCapabilityType` Ambient noise sensor — `AmbientNoiseSensorCapabilityType` Temperature sensor — `TemperatureSensorCapabilityType` Humidity sensor — `HumiditySensorCapabilityType` Distance sensor — `DistanceSensorCapabilityType` Atmospheric pressure Sensor — `AtmosphericPressureSensorCapabilityType` Position sensor — `PositionSensorCapabilityType` Velocity sensor — `VelocitySensorCapabilityType` Acceleration sensor — `AccelerationSensorCapabilityType`

IECNORM.COM : Click to view the full PDF of ISO/IEC 23005-2:2013

© ISO/IEC 2013 – All rights reserved

Name	*Definition*
	Orientation sensor: `OrientationSensorCapabilityType` Angular velocity sensor: `AngularVelocitySensorCapabilityType` Angular acceleration sensor: `AngularAccelerationSensorCapabilityType` Force sensor: `ForceSensorCapabilityType` Torque sensor: `TorqueSensorCapabilityType` Pressure sensor: `PressureSensorCapabilityType` Motion sensor: `MotionSensorCapabilityType` Intelligent camera sensor: `IntelligentCameraCapabilityType` Bend sensor: `BendSensorCapabilityType` Gas sensor: `GasSensorCapabilityType` Dust sensor: `DustSensorCapabilityType` Multi interaction point sensor: `MultiInteractionPointSensorCapabilityType` Gaze tracking sensor: `GazeTrackingSensorCapabilityType` Global position sensor: `GlobalPositionSensorCapabilityType` Altitude sensor: `AltitudeSensorCapabilityType`
`SensorCapabilityBaseType`	`SensorCapabilityBaseType` shall extend `dia:TeminalCapabilityBaseType` as defined in ISO/IEC 21000-7 and provides a base abstract type for a subset of types defined as part of the sensor device capability metadata types.
`UserSensoryPreferenceListType`	Wrapper element type which allows multiple occurrences of user preference descriptions on sensory effects.

IECNORM.COM : Click to view the full PDF of ISO/IEC 23005-2:2013

© ISO/IEC 2013 – All rights reserved

Name	*Definition*
`NumOfUserSensoryPref`	This field, which is only present in the binary representation, specifies the number of `USPreference` instances accommodated in the `UserSensoryPreferenceList`.
`IndividualUserSensoryPrefType`	This field, which is only present in the binary representation, describes which `USPreference` type shall be used. In the binary description, the following mapping table is used,

Terms of Effect	Binary representation for effect type (8bits)
Light effect	00000000
Flash effect	00000001
Heating effect	00000010
Cooling effect	00000011
Wind effect	00000100
Vibration effect	00000101
Sprayer effect	00000110
Scent effect	00000111
Fog effect	00001000
Color correction effect	00001001
Rigid body motion effect	00001010
Tactile effect	00001011
Kinesthetic effect	00001100
Reserved	00001101-11111111

IECNORM.COM : Click to view the full PDF of ISO/IEC 23005-2:2013

© ISO/IEC 2013 – All rights reserved

Name	*Definition*
USPreference	Specifies single description of user preference description on sensory effect. The list of single device capabilities are as follows Terms of Effect / Terms of user preference Light effect / LightPrefType Flash effect / FlashPrefType Heating effect / HeatingPrefType Cooling effect / CoolingPrefType Wind effect / WindPrefType Vibration effect / VibrationPrefType Scent effect / ScentPrefType Fog effect / FogPrefType Spraying effect / SprayingPrefType Color correction effect / ColorCorrectionPrefType Rigid body motion effect / RigidBodyMotionPrefType Tactile effect / TactilePrefType Kinesthetic effect / KinestheticPrefType
UserSensoryPreferenceBaseType	UserSensoryPreferenceBaseType shall extend dia:UserCharacteristicBaseType as defined in ISO/IEC 21000-7 and provides a base abstract type for a subset of types defined as part of the sensory device capability metadata types.
SensorAdaptationPreferenceListType	Wrapper element type which allows multiple occurrences of user preference descriptions on sensor adaptation.
NumOfSensorAdaptationPref	This field, which is only present in the binary representation, specifies the number of SAPreference instances accommodated in the SensorAdaptationPreferenceList.
IndividualSensorAdaptationPrefType	This field, which is only present in the binary representation, describes which SAPreference type shall be used. In the binary description, the following mapping table is used, Term of sensor adaptation preference / Binary representation for sensor type (8bits)

IECNORM.COM : Click to view the full PDF of ISO/IEC 23005-2:2013

© ISO/IEC 2013 – All rights reserved

Name	*Definition*	
	Light sensor adaptation preference	00000000
	Ambient noise sensor adaptation preference	00000001
	Temperature sensor adaptation preference	00000010
	Humidity sensor adaptation preference	00000011
	Distance sensor adaptation preference	00000100
	Atmospheric pressure sensor adaptation preference	00000101
	Position sensor adaptation preference	00000110
	Velocity sensor adaptation preference	00000111
	Acceleration sensor adaptation preference	00001000
	Orientation sensor adaptation preference	00001001
	Angular velocity sensor adaptation preference	00001010
	Angular acceleration sensor adaptation preference	00001011
	Force sensor adaptation preference	00001100
	Torque sensor adaptation preference	00001101
	Pressure sensor adaptation preference	00001110
	Motion sensor adaptation preference	00001111
	Intelligent camera sensor adaptation preference	00010000
	Reserved	00010001-11111111
SAPreference	Specifies single description of user preference description on sensor adaptation. The list of single device capabilities are as follows	

IECNORM.COM : Click to view the full PDF of ISO/IEC 23005-2:2013

© ISO/IEC 2013 – All rights reserved

Name	*Definition*
	Term of Sensor / Sensor adaptation preference type Light sensor / LightAdaptationPrefType Ambient noise sensor / AmbientNoiseAdaptationPrefType Temperature sensor / TemperatureAdaptationPrefType Humidity sensor / HumidityAdaptationPrefType Distance sensor / DistanceAdaptationPrefType Atmospheric pressure Sensor / AtmosphericPressureAdaptationPrefType Position sensor / PositionAdaptationPrefType Velocity sensor / VelocityAdaptationPrefType Acceleration sensor / AccelerationAdaptationPrefType Orientation sensor / OrientationAdaptationPrefType Angular velocity sensor / AngularVelocityAdaptationPrefType Angular acceleration sensor / AngularAccelerationAdaptationPrefType Force sensor / ForceAdaptationPrefType Torque sensor / TorqueAdaptationPrefType Pressure sensor / PressureAdaptationPrefType Motion sensor / MotionAdaptationPrefType Intelligent camera sensor / IntelligentCameraAdaptationPrefType
SensorAdaptationPreferenceBaseType	SensorAdaptationPreferenceBaseType shall extend dia:UserCharacteristicBaseType as defined in ISO/IEC 21000-7 and provides a base abstract type for a subset of types defined as part of the sensory device capability metadata types.

IECNORM.COM : Click to view the full PDF of ISO/IEC 23005-2:2013

4.5.5 Examples

The followings are some examples of the ControlInfo type:

© ISO/IEC 2013 – All rights reserved

The following example shows an instantiation of `SensoryDeviceCapabilityList`. The `SensoryDeviceCapabilityList` allows multiple occurrences of `SensoryDeviceCapability` elements. For the details of `SensoryDeviceCapability` elements, please see the examples of individual sensory device capability types.

```
<cidl:ControlInfo xsi:schemaLocation="urn:mpeg:mpeg-v:2012:01-CIDL-NS CIDL.xsd"
xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance" xmlns:cidl="urn:mpeg:mpeg-
v:2012:01-CIDL-NS" xmlns:dcdv="urn:mpeg:mpeg-v:2012:01-DCDV-NS"
xmlns:sapv="urn:mpeg:mpeg-v:2012:01-SAPV-NS" xmlns:scdv="urn:mpeg:mpeg-v:2012:01-
SCDV-NS" xmlns:sepv="urn:mpeg:mpeg-v:2012:01-SEPV-NS">
   <cidl:SensoryDeviceCapabilityList>
      <cidl:SensoryDeviceCapability xsi:type="dcdv:LightCapabilityType">
         . . .
      </cidl:SensoryDeviceCapability>
         . . .
   </cidl:SensoryDeviceCapabilityList>
</cidl:ControlInfo>
```

The following example shows an instantiation of `SensorDeviceCapabilityList`. The `SensorDeviceCapabilityList` allows multiple occurrences of `SensorDeviceCapability` elements. For the details of `SensorDeviceCapability` elements, please see the examples of individual sensor device capability types.

```
<cidl:ControlInfo xsi:schemaLocation="urn:mpeg:mpeg-v:2012:01-CIDL-NS CIDL.xsd"
xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance" xmlns:cidl="urn:mpeg:mpeg-
v:2012:01-CIDL-NS" xmlns:dcdv="urn:mpeg:mpeg-v:2012:01-DCDV-NS"
xmlns:sapv="urn:mpeg:mpeg-v:2012:01-SAPV-NS" xmlns:scdv="urn:mpeg:mpeg-v:2012:01-
SCDV-NS" xmlns:sepv="urn:mpeg:mpeg-v:2012:01-SEPV-NS">
   <cidl:SensorDeviceCapabilityList>
      <cidl:SensorDeviceCapability
         xsi:type="scdv:AmbientNoiseSensorCapabilityType">
         . . .
      </cidl:SensorDeviceCapability>
      . . .
   </cidl:SensorDeviceCapabilityList>
</cidl:ControlInfo>
```

The following example shows an instantiation of `UserSensoryPreferenceList`. The `UserSensoryPreferenceList` allows multiple occurrences of `USPreference` elements. For the details of `USPreference`, please see the examples of user's sensory preference on individual sensory effects.

```
<cidl:ControlInfo xsi:schemaLocation="urn:mpeg:mpeg-v:2012:01-CIDL-NS CIDL.xsd"
xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance" xmlns:cidl="urn:mpeg:mpeg-
v:2012:01-CIDL-NS" xmlns:dcdv="urn:mpeg:mpeg-v:2012:01-DCDV-NS"
xmlns:sapv="urn:mpeg:mpeg-v:2012:01-SAPV-NS" xmlns:scdv="urn:mpeg:mpeg-v:2012:01-
SCDV-NS" xmlns:sepv="urn:mpeg:mpeg-v:2012:01-SEPV-NS">
   <cidl:UserSensoryPreferenceList>
      <cidl:USPreference xsi:type="sepv:CoolingPrefType">
         . . .
      </cidl:USPreference>
      . . .
   </cidl:UserSensoryPreferenceList>
</cidl:ControlInfo>
```

IECNORM.COM : Click to view the full PDF of ISO/IEC 23005-2:2013

© ISO/IEC 2013 – All rights reserved

The following example shows an instantiation of `SensorAdaptationPreferenceList`. The `SensorAdaptationPreferenceList` allows multiple occurrences of `SAPreference` elements. For the details of `SAPreference`, please see the examples of user's preference on individual sensor adaptation.

```
<cidl:ControlInfo  xsi:schemaLocation="urn:mpeg:mpeg-v:2012:01-CIDL-NS  CIDL.xsd"
xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"  xmlns:cidl="urn:mpeg:mpeg-
v:2012:01-CIDL-NS"                    xmlns:dcdv="urn:mpeg:mpeg-v:2012:01-DCDV-NS"
xmlns:sapv="urn:mpeg:mpeg-v:2012:01-SAPV-NS" xmlns:scdv="urn:mpeg:mpeg-v:2012:01-
SCDV-NS" xmlns:sepv="urn:mpeg:mpeg-v:2012:01-SEPV-NS">
   <cidl:SensorAdaptationPreferenceList>
      <cidl:SAPreference xsi:type="sapv:IntelligentCameraAdaptationPrefType">
         . . .
      </cidl:SAPreference>
      . . .
   </cidl:SensorAdaptationPreferenceList>
</cidl:ControlInfo>
```

4.6 Sensory device capability description

4.6.1 Introduction

This Subclause specifies tools for describing device capabilites of sensory devices. The following Subclause defines an abstract complex type of SensoryDeviceCapabilityBaseType, which the device capability description of individual sensory device should inherit.

4.6.2 Reference coordinate system

The origin of the reference coordinate for sensory devices is located at the position of the user. Each axis is defined as follows. X-axis is in the direction of the right hand side of the user facing the screen. Y-axis is in the reverse direction of gravity. Z-axis is in the direction of the user's facing the screen. The x-, y-, and z-axis are depicted in Figure 2.

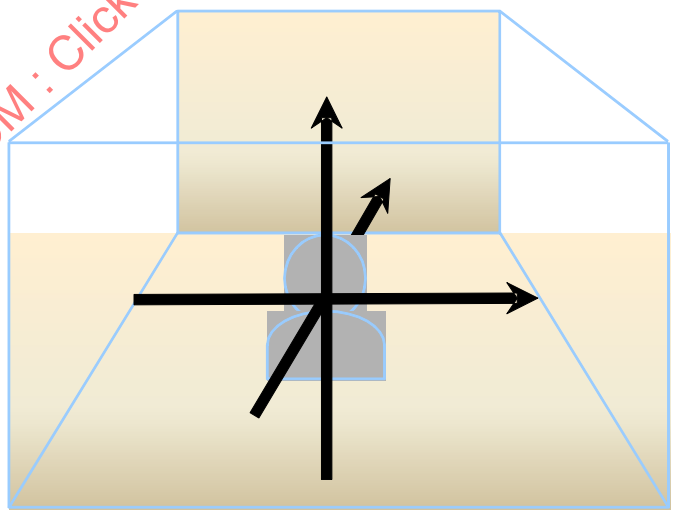

Figure 2 — Reference Coordinate System for Sensory Devices

IECNORM.COM : Click to view the full PDF of ISO/IEC 23005-2:2013

© ISO/IEC 2013 – All rights reserved

4.6.3 Sensory device capability base type

4.6.3.1 XML representation syntax

```
<!-- ################################################ -->
<!--  Sensory Device capability base type             -->
<!-- ################################################ -->
<complexType name="SensoryDeviceCapabilityBaseType" abstract="true">
   <complexContent>
      <extension base="dia:TerminalCapabilityBaseType">
         <attributeGroup ref="cidl:sensoryDeviceCapabilityAttributes"/>
      </extension>
   </complexContent>
</complexType>
```

4.6.3.2 Binary representation syntax

SensoryDeviceCapabilityBaseType{	**(Number of bits)**	**(Mnemonic)**
TerminalCapabilityBase		TerminalCapabilityBaseType
sensoryDeviceCapabilityAttributes		sensoryDeviceCapabilityAttributesType
}		

4.6.3.3 Semantics

Semantics of the `SensoryDeviceCapabilityBaseType` type:

Name	*Definition*
`SensoryDeviceCapabilityBaseType`	`SensoryDeviceCapabilityBaseType` shall extend `dia:TeminalCapabilityBaseType` as defined in ISO/IEC 21000-7 and provides a base abstract type for a subset of types defined as part of the sensory device capability metadata types.
`sensoryDeviceCapabilityAttributes`	Describes a group of attributes for the device capabilities.

4.6.4 Sensory device capability base attributes

4.6.4.1 XML representation syntax

```
<!-- ################################################   -->
<!--  Sensory Device Capability Attributes              -->
<!-- ################################################   -->
<attributeGroup name="sensoryDeviceCapabilityAttributes">
   <attribute name="zerothOrderDelayTime" type="nonNegativeInteger"
      use="optional"/>
   <attribute name="firstOrderDelayTime" type="nonNegativeInteger"
      use="optional"/>
   <attribute name="locator" type="mpeg7:termReferenceType" use="optional"/>
</attributeGroup>
```

IECNORM.COM : Click to view the full PDF of ISO/IEC 23005-2:2013

© ISO/IEC 2013 – All rights reserved

4.6.4.2 Binary representation syntax

sensoryDeviceCapabilityAttributes {	**(Number of bits)**	**(Mnemonic)**
zerothOrderDelayTimeFlag	1	bslbf
firstOrderDelayTimeFlag	1	bslbf
locatorFlag	1	bslbf
if(zerothOrderDelayTimeFlag){		
zerothOrderDelayTime	16	uimsbf
}		
if(firstOrderDelayTimeFlag){		
firstOrderDelayTime	16	uimsbf
}		
if(locatorFlag){		
locator	8	blsbf
}		
}		

4.6.4.3 Semantics

Semantics of the `sensoryDeviceCapabilityAttributes` type:

Name	*Definition*
`sensoryDeviceCapability Attributes`	Describes a group of attributes for the sensory device capabilities.
`zerothOrderDelayTimeFlag`	This field, which is only present in the binary representation, signals the presence of the activation attribute. A value of ”1” means the attribute shall be used and ”0” means the attribute shall not be used.
`firstOrderDelayTimeFlag`	This field, which is only present in the binary representation, signals the presence of the activation attribute. A value of ”1” means the attribute shall be used and ”0” means the attribute shall not be used.
`locatorFlag`	This field, which is only present in the binary representation, signals the presence of the activation attribute. A value of ”1” means the attribute shall be used and ”0” means the attribute shall not be used.
`zerothOrderDelayTime`	Describes required preparation time of a sensory device to be activated since it receives a command in the unit of millisecond (ms).
`firstOrderDelayTime`	Describes the delay time for a device to reach the target intensity since it receives a command and is activated in the unit of millisecond (ms).

IECNORM.COM : Click to view the full PDF of ISO/IEC 23005-2:2013

© ISO/IEC 2013 – All rights reserved

Name	*Definition*
`locator`	Describes the position of the device from the user's perspective according to the x-, y-, and z-axis as a reference to the `LocationCS` as defined in Annex 2.3 of ISO/IEC 23005-6. In the binary description, the following mapping table is used,

locationTypeCS	**Term ID of location**
00000000	left
00000001	centerleft
00000010	center
00000011	centerright
00000100	right
00000101	bottom
00000110	middle
00000111	top
00001000	back
00001001	midway
00001010	front
00001011-11111111	Reserved

IECNORM.COM : Click to view the full PDF of ISO/IEC 23005-2:2013

4.6.4.4 Examples

The following example shows a use of `sensoryDeviceCapabilityAttributes`, which describes that a sensory device, specified by the identifier value of *`ldc1`*, of "*`specific_sensory_device_capability_type`*" requires preparation time of 0 ms to start, and 1 ms to reach target intensity, and is located at the left side according to the position model defined in Annex 2.3 of ISO/IEC 23005-6.

```
<cidl:SensoryDeviceCapability
xsi:type="dcdv:specific_sensory_device_capability_type"   firstOrderDelayTime="0"
zerothOrderDelayTime="1"  id="ldc1"  locator="urn:mpeg:mpeg-v:01-SI-LocationCS  -
NS:left"/>
```

4.7 Sensor capability description

4.7.1 Introduction

This Subclause specifies tools for describing Sensor capability of individual sensors. The following Subclause defines the global coordinate for sensors which depends on the real world environment of user to determine

© ISO/IEC 2013 – All rights reserved

the location of the sensors. An abstract complex type of SensorCapabilityBaseType, which the sensor capability description of individual device should inherit, is defined in the following Subclause.

4.7.2 Global coordinate for sensors

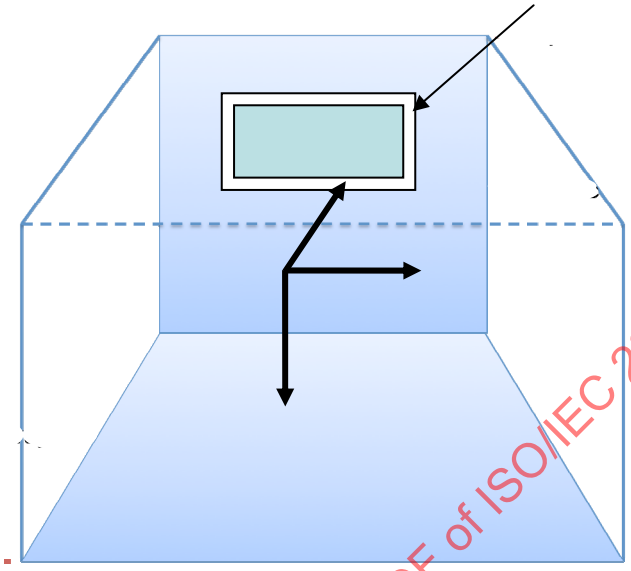

Figure 3 — Global coordinate for sensors

The origin of the global coordinate for sensors is located at the position of the user adapting the right handed coordinate system. Each axis is defined as follows. Y-axis is in the direction of gravity. X-axis is in the direction of the top right corner of the screen. Z-axis is in the opposite direction of the user's position. The x-, y-, and z-axis are depicted in Figure 3.

4.7.3 Sensor capability base type

4.7.3.1 XML representation syntax

```
<!-- ################################################ -->
<!--  Sensor Capability base type                     -->
<!-- ################################################ -->
<complexType name="SensorCapabilityBaseType" abstract="true">
   <complexContent>
      <extension base="dia:TerminalCapabilityBaseType">
         <sequence>
            <element name="Accuracy" type="cidl:AccuracyType" minOccurs="0"/>
         </sequence>
         <attributeGroup ref="cidl:sensorCapabilityBaseAttributes"/>
      </extension>
   </complexContent>
</complexType>

<complexType name="AccuracyType" abstract="true"/>

<complexType name="PercentAccuracy">
   <complexContent>
```

IECNORM.COM : Click to view the full PDF of ISO/IEC 23005-2:2013

© ISO/IEC 2013 – All rights reserved

```
        <extension base="cidl:AccuracyType">
            <attribute name="value" type="mpeg7:zeroToOneType"/>
        </extension>
    </complexContent>
</complexType>

<complexType name="ValueAccuracy">
    <complexContent>
        <extension base="cidl:AccuracyType">
            <attribute name="value" type="float"/>
        </extension>
    </complexContent>
</complexType>
```

4.7.3.2 Binary representation syntax

SensorCapabilityBaseType {	**(Number of bits)**	**(Mnemonic)**
AccuracyFlag	1	bslbf
TerminalCapabilityBase		TerminalCapabilityBaseType
if(AccuracyFlag){		
Accuracy		AccuracyType
}		
SensorCapabilityBaseAttributes		SensorCapabilityBaseAttributesType
}		
AccuracyType {		
AccuracySelect	2	bslbf
if(AccuracySelect==00){		
PercentAccuracy	32	fsbf
} else if (AccuracySelect==01) {		
ValueAccuracy	32	fsbf
}		
}		

IECNORM.COM : Click to view the full PDF of ISO/IEC 23005-2:2013

© ISO/IEC 2013 – All rights reserved

4.7.3.3 Semantics

Semantics of the `SensorCapabilityBaseType`:

Name	*Definition*
`SensorCapabilityBaseType`	`SensorCapabilityBaseType` shall extend `dia:TeminalCapabilityBaseType` as defined in ISO/IEC 21000-7 and provides a base abstract type for a subset of types defined as part of the sensor device capability metadata types.
`AccuracyFlag`	This field, which is only present in the binary representation, signals the presence of the activation attribute. A value of "1" means the attribute shall be used and "0" means the attribute shall not be used.
`Accuracy`	Describes the degree of closeness of a measured quantity to its actual value in `AccuracyType`.
`sensorCapabilityBase Attributes`	Describes a group of attributes for the sensor capabilities.

Semantics of the `AccuracyType`:

Name	*Definition*
`AccuracyType`	Becomes a parent type providing a choice of describing the accuracy in either relative value or absolute value.
`AccuracySelect`	This field, which is only present in the binary representation, describes which accuracy scheme shall be used. "0" means that the PercentAccuracy type shall be used, and "1" means that the ValueAccuracy type shall be used.
`PercentAccuracy`	Describes the degree of closeness of a measured quantity to its actual value in a relative way using a value ranging from 0 to 1.0.
`value`	Provides an actual value in a relative way for accuracy where value 0 means 0 % accuracy and value 1.0 means 100 % accuracy. It shall be a `zeroToOneType` type as defined in ISO/IEC 15938-5:2003.
`ValueAccuracy`	Describes the degree of closeness of a measured quantity to its actual value in an absolute value of given unit.
`value`	Provides an actual value in an absolute way, where the value means the possible range of error as (`-value, +value`) of given unit.

4.7.3.4 Examples

For examples of using `SensorCapabilityBaseType` please see the examples provided by the individual sensor device capability types.

IECNORM.COM : Click to view the full PDF of ISO/IEC 23005-2:2013

© ISO/IEC 2013 – All rights reserved

4.7.4 Sensor capability base attributes

4.7.4.1 XML representation syntax

```
<!-- ################################################ -->
<!-- Sensor Capability Base Attributes                -->
<!-- ################################################ -->
<attributeGroup name="sensorCapabilityBaseAttributes">
    <attribute name="unit" type="mpegvct:unitType" use="optional"/>
    <attribute name="maxValue" type="float" use="optional"/>
    <attribute name="minValue" type="float" use="optional"/>
    <attribute name="offset" type="float" use="optional"/>
    <attribute name="numOfLevels" type="nonNegativeInteger" use="optional"/>
    <attribute name="sensitivity" type="float" use="optional"/>
    <attribute name="SNR" type="float" use="optional"/>
</attributeGroup>
```

4.7.4.2 Binary representation syntax

SensorCapabilityBaseAttributesType {	(Number of bits)	(Mnemonic)
unitFlag	1	bslbf
maxValueFlag	1	bslbf
minValueFlag	1	bslbf
offsetFlag	1	bslbf
numOfLevelsFlag	1	bslbf
sensitivityFlag	1	bslbf
SNRFlag	1	bslbf
if(unitFlag){		
unit	8	bslbf
}		
if(maxValueFlag){		
maxValue	32	fsbf
}		
if(minValueFlag){		
minValue	32	fsbf
}		
if(offsetFlag){		

IECNORM.COM : Click to view the full PDF of ISO/IEC 23005-2:2013

© ISO/IEC 2013 – All rights reserved

SensorCapabilityBaseAttributesType {	**(Number of bits)**	**(Mnemonic)**
offset	32	fsbf
}		
if(numOfLevelsFlag){		
numOfLevels	16	uimsbf
}		
if(sensitivityFlag){		
sensitivity	32	fsbf
}		
if(SNRFlag){		
SNR	32	fsbf
}		
}		

4.7.4.3 Semantics

Semantics of the `SensorCapabilityBaseAttributes`:

Name	*Definition*
`sensorCapabilityBase Attributes`	Describes a group of attributes for the sensor capabilities.
`unitFlag`	This field, which is only present in the binary representation, signals the presence of the activation attribute. A value of ”1” means the attribute shall be used and ”0” means the attribute shall not be used.
`maxValueFlag`	This field, which is only present in the binary representation, signals the presence of the activation attribute. A value of ”1” means the attribute shall be used and ”0” means the attribute shall not be used.
`minValueFlag`	This field, which is only present in the binary representation, signals the presence of the activation attribute. A value of ”1” means the attribute shall be used and ”0” means the attribute shall not be used.
`offsetFlag`	This field, which is only present in the binary representation, signals the presence of the activation attribute. A value of ”1” means the attribute shall be used and ”0” means the attribute shall not be used.
`numOfLevelsFlag`	This field, which is only present in the binary representation, signals the presence of the activation attribute. A value of ”1” means the attribute shall be used and ”0” means the attribute shall not be used.

IECNORM.COM : Click to view the full PDF of ISO/IEC 23005-2:2013

© ISO/IEC 2013 – All rights reserved

Name	*Definition*
sensitivityFlag	This field, which is only present in the binary representation, signals the presence of the activation attribute. A value of ”1” means the attribute shall be used and ”0” means the attribute shall not be used.
SNRFlag	This field, which is only present in the binary representation, signals the presence of the activation attribute. A value of ”1” means the attribute shall be used and ”0” means the attribute shall not be used.
unit	Describes the unit of the sensor’s measuring value. Specifies the unit of the sensor’s measuring value as a reference to a classification scheme term provided by UnitTypeCS defined in A.2.1 of ISO/IEC 23005-6, if a unit other than the default unit specified in the semantics of the maxValue and minValue is used for the values of maxValue and minValue are used.
maxValue	Describes the maximum value that the sensor can perceive. The terms will be different according to the individual sensor type.
minValue	Describes the minimum value that the sensor can perceive. The terms will be different according to the individual sensor type.
offset	Describes the number of value locations added to a base value in order to get to a specific absolute value.
numOfLevels	Describes the number of value levels that the sensor can perceive in between maximum and minimum value. EXAMPLE The value 5 means the sensor can perceive 5 steps from minValue to maxValue.
sensitivity	Describes the minimum magnitude of input signal required to produce a specified output signal in given unit.
SNR	Describes the ratio of a signal power to the noise power corrupting the signal.

4.7.4.4 Examples

The following example shows a use of SensorCapabilityBaseAttributes. It shows that an arbitrary sensor device of type any_specific_sensor_device_capability_type has an id of “ans01” with maxValue of 100, minValue of 10, 20 levels, offset of -3, sensitivity of 0.8, and SNR of 99 dB. It also shows that the measuring unit of the specified sensor device is dB.

```
<cidl:SensorDeviceCapability
xsi:type="scdv:any_specific_sensor_device_capability_type"                id="ans01"
maxValue="100"   minValue="10"   numOfLevels="20"   offset="-3"   sensitivity="0.8"
SNR="99" unit="dB"/>
```

IECNORM.COM : Click to view the full PDF of ISO/IEC 23005-2:2013

© ISO/IEC 2013 – All rights reserved

4.8 User's sensory preference description

4.8.1 Introduction

This Subclause specifies tools for describing preferences of individual users regarding the sensory experience. The following Subclauses define an abstract complex type of UserSensoryPreferenceBaseType, which the user preferences on each individual type of sensory experience should inherit.

4.8.2 User sensory preference base type

4.8.2.1 XML representation syntax

```
<!-- ################################################ -->
<!--  User Sensory Preference base type               -->
<!-- ################################################ -->
<complexType name="UserSensoryPreferenceBaseType" abstract="true">
   <complexContent>
      <extension base="dia:UserCharacteristicBaseType">
         <attributeGroup ref="cidl:userSensoryPrefBaseAttributes"/>
      </extension>
   </complexContent>
</complexType>
```

4.8.2.2 Binary representation syntax

UserSensoryPreferenceBaseType {	**(Number of bits)**	**(Mnemonic)**
UserCharacteristicBase		UserCharacteristicBaseType
userSensoryPrefBaseAttributes		userSensoryPrefBaseAttributesType
}		

4.8.2.3 Semantics

Semantics of the `UserSensoryPreferenceBaseType` type:

Name	*Definition*
`UserSensoryPreferenceBaseType`	`UserSensoryPreferenceBaseType` shall extend `dia:UserCharacteristicBaseType` as defined in ISO/IEC 21000-7 and provides a base abstract type for a subset of types defined as part of the sensory device capability metadata types.
`userSensoryPrefBaseAttributes`	Describes a group of common attributes for the describing user preferences on sensory experience.

4.8.2.4 Examples

For the examples of `UserSensoryPreferenceBaseType`, please see the examples of preferences on individual sensory effect type.

IECNORM.COM : Click to view the full PDF of ISO/IEC 23005-2:2013

© ISO/IEC 2013 – All rights reserved

4.8.3 User sensory preference base attributes

4.8.3.1 XML representation syntax

```
<!-- ################################################ -->
<!--  User Sensory Preference Base Attributes         -->
<!-- ################################################ -->
<attributeGroup name="userSensoryPrefBaseAttributes">
   <attribute name="adaptationMode" type="cidl:adaptationModeType"
      use="optional"/>
   <attribute name="activate" type="boolean" use="optional"/>
</attributeGroup>

<!--  User Preference of Adaptation Mode Types      -->
<simpleType name="adaptationModeType">
   <restriction base="string">
      <enumeration value="strict"/>
      <enumeration value="scalable"/>
   </restriction>
</simpleType>
```

4.8.3.2 Binary representation syntax

userSensoryPrefBaseAttributesType {	**(Number of bits)**	**(Mnemonic)**
adaptationModeFlag	1	bslbf
activateFlag	1	bslbf
if(adaptationModeFlag){		
adaptationMode		adaptationModeType
}		
if(activateFlag){		
activate	1	bslbf
}		
}		
adaptationModeType {		
adaptationMode	2	bslbf
}		

4.8.3.3 Semantics

Semantics of the `userSensoryPrefBaseAttributes` type:

IECNORM.COM : Click to view the full PDF of ISO/IEC 23005-2:2013

© ISO/IEC 2013 – All rights reserved

Name	*Definition*
`userSensoryPrefBase Attributes`	Describes a group of common attributes for the describing user preferences on sensory experience.
`adaptationModeFlag`	This field, which is only present in the binary representation, signals the presence of the activation attribute. A value of ”1” means the attribute shall be used and ” 0” means the attribute shall not be used.
`activateFlag`	This field, which is only present in the binary representation, signals the presence of the activation attribute. A value of ”1” means the attribute shall be used and ”0” means the attribute shall not be used.
`adaptationMode`	Describes the user’s preference on the adaptation method for the sensory effect. EXAMPLE The value “strict” means the user prefer to render sensory effect exactly as described. Otherwise the value “scalable” means to render sensory effect with scaled intensity according to the device capacity.
`activate`	Describes whether the effect shall be activated. A value of `true` means the effect shall be activated and `false` means the effect shall be deactivated.
`adaptationModeType`	Tool for describing the adaptation mode with enumeration set. When its value is `strict`, it means that when the input value is out of range, the output should be equal to the maximum value that the device is able to operate. When its value is `scalable`, it means that the output shall be linearly scaled into the range that the device can operate. In the binary description, the following mapping table is used, adaptationModeType | adaptationMode 00 | strict 01 | scalable 10-11 | Reserved

4.8.3.4 Examples

For the examples of `userSensoryPrefBaseAttributes`, please see the examples of preferences on individual sensory effect type.

4.9 Sensor adaptation preference description

4.9.1 Introduction

This Subclause specifies tools for describing preferences of individual users regarding the sensed information. The following Subclauses define an abstract complex type of SensorAdaptationPreferenceBaseType, which the user preferences on each individual type of sensed information should inherit.

IECNORM.COM : Click to view the full PDF of ISO/IEC 23005-2:2013

© ISO/IEC 2013 – All rights reserved

4.9.2 Sensor adaptation preference base type

4.9.2.1 XML representation syntax

```
<!-- ################################################ -->
<!--  Sensor Adaptation Preference base type          -->
<!-- ################################################ -->
<complexType name="SensorAdaptationPreferenceBaseType" abstract="true">
   <complexContent>
      <extension base="dia:UserCharacteristicBaseType">
         <attributeGroup ref="cidl:sensorAdaptationPrefBaseAttributes"/>
      </extension>
   </complexContent>
</complexType>
```

4.9.2.2 Binary representation syntax

SensorAdaptationPreferenceBaseType {	**(Number of bits)**	**(Mnemonic)**
UserCharacteristicBase		UserCharacteristicBaseType
sensorAdaptationPrefBaseAttributes		sensorAdaptationPrefBaseAttributesType
}		

4.9.2.3 Semantics

Semantics of the `SensorAdaptationPreferenceBaseType` type:

Name	*Definition*
`SensorAdaptationPreferenceBaseType`	`SensorAdaptationPreferenceBaseType` shall extend `dia:UserCharacteristicBaseType` as defined in ISO/IEC 21000-7 and provides a base abstract type for a subset of types defined as part of the sensor capability metadata types.
`SensorAdaptationPrefBaseAttributes`	Describes a group of common attributes for describing the adaptation preferences on sensed information.

4.9.2.4 Examples

For the examples of `SensorAdaptationPreferenceBaseType`, please see the examples of preferences on individual sensor adaptation preference type.

4.9.3 Sensor adaptation preference base attributes

4.9.3.1 XML representation syntax

```
<!-- ################################################ -->
<!--  Sensor Adaptation Preference Base Attributes    -->
<!-- ################################################ -->
<attributeGroup name="sensorAdaptationPrefBaseAttributes">
```

IECNORM.COM : Click to view the full PDF of ISO/IEC 23005-2:2013

© ISO/IEC 2013 – All rights reserved

```
   <attribute name="sensorIdRef" type="anyURI" use="optional"/>
   <attribute name="sensorAdaptationMode" type="cidl:sensorAdaptationModeType"
use="optional"/>
   <attribute name="activate" type="boolean" use="optional"/>
   <attribute name="unit" type="mpegvct:unitType" use="optional"/>
   <attribute name="maxValue" type="float" use="optional"/>
   <attribute name="minValue" type="float" use="optional"/>
   <attribute name="numOfLevels" type="nonNegativeInteger" use="optional"/>
</attributeGroup>
<!--  Adaptation Preference of Sensor Adaptation Mode Types       -->
<simpleType name="sensorAdaptationModeType">
   <restriction base="string">
      <enumeration value="strict"/>
      <enumeration value="scalable"/>
   </restriction>
</simpleType>
```

4.9.3.2 Binary representation syntax

sensorAdaptationPrefBaseAttributesType {	(Number of bits)	(Mnemonic)
sensorIdRefFlag	1	bslbf
sensorAdaptationModeFlag	1	bslbf
activateFlag	1	bslbf
unitFlag	1	bslbf
maxValueFlag	1	bslbf
minValueFlag	1	bslbf
numOfLevelsFlag	1	bslbf
If(sensorIdRefFlag) {		
sensorIdRef	See ISO 10646	UTF-8
}		
If(sensorAdaptationModeFlag) {		
sensorAdaptationMode		sensorAdaptationModeType
}		
If(activateFlag) {		
activate	1	bslbf
}		
If(unitFlag) {		

IECNORM.COM : Click to view the full PDF of ISO/IEC 23005-2:2013

© ISO/IEC 2013 – All rights reserved

sensorAdaptationPrefBaseAttributesType {	(Number of bits)	(Mnemonic)
unit	8	bslbf
}		
If(maxValueFlag) {		
maxValue	32	fsbf
}		
If(minValueFlag) {		
minValue	32	fsbf
}		
If(numOfLevelsFlag) {		
numOfLevels		vluimsbf5
}		
}		
sensorAdaptationModeType {		
value	2	bslbf
}		

4.9.3.3 Semantics

Semantics of the `SensorAdaptatinPrefBaseAttributes` type:

Name	*Definition*
`SensorAdaptationPrefBaseAttributes`	Describes a group of common attributes for the describing adaptation preferences on sensed information.
`sensorIdRefFlag`	This field, which is only present in the binary representation, signals the presence of the activation attribute. A value of ”1” means the attribute shall be used and ”0” means the attribute shall not be used.
`sensorAdaptationModeFlag`	This field, which is only present in the binary representation, signals the presence of the activation attribute. A value of ”1” means the attribute shall be used and ”0” means the attribute shall not be used.
`activateFlag`	This field, which is only present in the binary representation, signals the presence of the activation attribute. A value of ”1” means the attribute shall be used and ”0” means the attribute shall not be used.

IECNORM.COM : Click to view the full PDF of ISO/IEC 23005-2:2013

© ISO/IEC 2013 – All rights reserved

Name	*Definition*
`unitFlag`	This field, which is only present in the binary representation, signals the presence of the activation attribute. A value of ”1” means the attribute shall be used and ”0” means the attribute shall not be used.
`maxValueFlag`	This field, which is only present in the binary representation, signals the presence of the activation attribute. A value of ”1” means the attribute shall be used and ”0” means the attribute shall not be used.
`minValueFlag`	This field, which is only present in the binary representation, signals the presence of the activation attribute. A value of ”1” means the attribute shall be used and ”0” means the attribute shall not be used.
`numOfLevelsFlag`	This field, which is only present in the binary representation, signals the presence of the activation attribute. A value of ”1” means the attribute shall be used and ”0” means the attribute shall not be used.
`sensorIdRef`	Refers the Id of an individual sensor that has generated the specific sensor adaptation preferences.
`sensorAdaptationMode`	Describes the user’s preference on the adaptation method for the sensed information. EXAMPLE The value “strict” means the user prefer to transmit sensed information tothe virtual world exactly as described. Otherwise the value “scalable” means to let the virtual world may adjust sensed information with scaled value according to user’s intention.
`activate`	Describes whether the user allows the sensed information to be used or not. A value of `”true”` means the sensed information is allowed to use and `”false”` means the sensed information is not allowed to use.
`unit`	Describes the unit of value which the user prefers to adapt.
`maxValue`	Describes the maximum desirable value of the sensed information according to the maximum scale defined within the semantics definition of the individual sensor.
`minValue`	Describes the minimum desirable value of the sensed information according to the minimum scale defined within the semantics definition of the individual sensor.
`numOfLevelsnumOfLevels`	Describes the desirable number of value levels in between maximum and minimum value.
`sensorAdaptationModeType`	Tool for describing the adaptation mode with enumeration set. When its value is `strict`, it means that when the input value is out of range, the output should be equal to the maximum value that the device is able to operate. When its value is `scalable`, it means that the output shall be linearly scaled into the range that the device can operate.

IECNORM.COM : Click to view the full PDF of ISO/IEC 23005-2:2013

4.9.3.4 Examples

For the examples of `sensorAdaptationPrefBaseAttributes`, please see the examples of preferences on individual sensor adaptation preference type.

© ISO/IEC 2013 – All rights reserved

5 Device capability description vocabulary

5.1 Introduction

This Clause describes syntax and semantics of the device capability description vocabulary to implement description of capability of individual devices.

5.2 Schema wrapper conventions

The Syntax defined in this Clause assumes the following Schema Wrapper to form a valid XML schema document.

```
<schema xmlns="http://www.w3.org/2001/XMLSchema"
xmlns:mpeg7="urn:mpeg:mpeg7:schema:2004" xmlns:mpegvct="urn:mpeg:mpeg-v:2012:01-
CT-NS" xmlns:cidl="urn:mpeg:mpeg-v:2012:01-CIDL-NS" xmlns:dcdv="urn:mpeg:mpeg-
v:2012:01-DCDV-NS" targetNamespace="urn:mpeg:mpeg-v:2012:01-DCDV-NS"
elementFormDefault="qualified" attributeFormDefault="unqualified"
version="ISO/IEC 23005-2" id="MPEG-V-DCDV.xsd">
   <import namespace="urn:mpeg:mpeg7:schema:2004"
schemaLocation="http://standards.iso.org/ittf/PubliclyAvailableStandards/MPEG-
7_schema_files/mpeg7-v2.xsd"/>
   <import namespace="urn:mpeg:mpeg-v:2012:01-CIDL-NS"
schemaLocation="CIDL.xsd"/>
   <import namespace="urn:mpeg:mpeg-v:2012:01-CT-NS" schemaLocation="MPEG-V-
CT.xsd"/>
```

Additionally, the following line should be appended to the resulting schema document in order to obtain a well-formed XML document.

```
</schema>
```

5.3 Light capability type

5.3.1 XML representation syntax

```
<!-- ################################################ -->
<!-- Light capability type                            -->
<!-- ################################################ -->
<complexType name="LightCapabilityType">
   <complexContent>
      <extension base="cidl:SensoryDeviceCapabilityBaseType">
         <sequence>
            <element name="Color" type="mpegvct:colorType" minOccurs="0"
               maxOccurs="unbounded"/>
         </sequence>
         <attribute name="unit" type="mpegvct:unitType" use="optional"/>
         <attribute name="maxIntensity" type="nonNegativeInteger"
            use="optional"/>
         <attribute name="numOfLightLevels" type="nonNegativeInteger"
            use="optional"/>
      </extension>
   </complexContent>
</complexType>
```

IECNORM.COM : Click to view the full PDF of ISO/IEC 23005-2:2013

© ISO/IEC 2013 – All rights reserved

5.3.2 Binary representation syntax

LightCapabilityType {	(Number of bits)	(Mnemonic)
ColorFlag	1	bslbf
unitFlag	1	bslbf
maxIntensityFlag	1	bslbf
numOfLightLevelsFlag	1	bslbf
SensoryDeviceCapabilityBase		SensoryDeviceCapabilityBaseType
if(ColorFlag){		
LoopColor		vluimsbf5
for(k=0;k<LoopColor;k++){		
Color[k]		ColorType
}		
}		
if(unitFlag){		
unit	8	bslbf
}		
if(maxIntensityFlag){		
maxIntensity	32	uimsbf
}		
if(numOfLightLevelsFlag){		
numOfLightLevels	16	uimsbf
}		
}		

IECNORM.COM : Click to view the full PDF of ISO/IEC 23005-2:2013

5.3.3 Semantics

Semantics of the `LightCapabilityType` type:

Name	*Definition*
`LightCapabilityType`	Tool for describing a light capability.
`ColorFlag`	This field, which is only present in the binary representation, signals the presence of the activation attribute. value of ”1” means the attribute shall be

© ISO/IEC 2013 – All rights reserved

Name	*Definition*
	used and ”0” means the attribute shall not be used.
`unitFlag`	This field, which is only present in the binary representation, signals the presence of the activation attribute. A value of ”1” means the attribute shall be used and ”0” means the attribute shall not be used.
`maxIntensityFlag`	This field, which is only present in the binary representation, signals the presence of the activation attribute. A value of ”1” means the attribute shall be used and ”0” means the attribute shall not be used.
`numOfLightLevelsFlag`	This field, which is only present in the binary representation, signals the presence of the activation attribute. A value of ”1” means the attribute shall be used and ”0” means the attribute shall not be used.
`unit`	Specifies the unit of the maxIntensity, if a unit other than the default unit is used, as a reference to a classification scheme term provided by UnitTypeCS defined in A.2.1 of ISO/IEC 23005-6.
`maxIntensity`	Describes the maximum intensity that the lighting device can provide in terms of LUX.
`numOfLightLevels`	Describes the number of intensity levels that the device can provide in between maximum and minimum intensity of light.
`LoopColor`	This field, which is only present in the binary representation, specifies the number of Color contained in the description.
`Color`	Describes the list of colors which the lighting device can provide as a reference to a classification scheme term or as RGB value. A CS that may be used for this purpose is the `ColorCS` defined in A.2.2 of ISO/IEC 23005-6. EXAMPLE `urn:mpeg:mpeg-v:01-SI-ColorCS-NS:alice_blue` would describe the color Alice blue.

IECNORM.COM : Click to view the full PDF of ISO/IEC 23005-2:2013

5.3.4 Examples

This example shows the description of a light capability with the following semantics. The light identifier is “`light1`”. The maximum intensity of the light is 300 lux. There are 10 light levels between maximum and minimum intensity. The location of the light is the right side according to the position model described in Figure 3 of ISO/IEC 23005-3. The colors that can be displayed by the light are “white”, “red”, “blue”, and “green” from the classification scheme described in A.2.2 of ISO/IEC 23005-6.

```
<cidl:SensoryDeviceCapability xsi:type="dcdv:LightCapabilityType"
id="light1" unit="urn:mpeg:mpeg-v:01-CI-UnitTypeCS-NS:lux"
maxIntensity="300" numOfLightLevels="10" locator="urn:mpeg:mpeg-v:01-SI-
LocationCS-NS:right">
    <dcdv:Color>
    urn:mpeg:mpeg-v:01-SI-ColorCS-NS:white
    </dcdv:Color>
    <dcdv:Color>
    urn:mpeg:mpeg-v:01-SI-ColorCS-NS:red
    </dcdv:Color>
    <dcdv:Color>
    urn:mpeg:mpeg-v:01-SI-ColorCS-NS:blue
    </dcdv:Color>
```


© ISO/IEC 2013 – All rights reserved

```
    <dcdv:Color>
    urn:mpeg:mpeg-v:01-SI-ColorCS-NS:green
    </dcdv:Color>
</cidl:SensoryDeviceCapability>
```

5.4 Flash capability type

5.4.1 XML representation syntax

```
<!-- ################################################ -->
<!--  Flash capability type                           -->
<!-- ################################################ -->
<complexType name="FlashCapabilityType">
    <complexContent>
        <extension base="dcdv:LightCapabilityType">
            <attribute name="maxFrequency" type="positiveInteger" use="optional"/>
            <attribute name="numOfFreqLevels" type="nonNegativeInteger"
                use="optional"/>
        </extension>
    </complexContent>
</complexType>
```

5.4.2 Binary representation syntax

FlashCapabilityType {	**(Number of bits)**	**(Mnemonic)**
maxFrequencyFlag	1	bslbf
numOfFreqLevelsFlag	1	bslbf
LightCapability		LightCapabilityType
if(maxFrequencyFlag){		
maxFrequency	8	uimsbf
}		
if(numOfFreqLevelsFlag){		
numOfFreqLevels	8	uimsbf
}		
}		

5.4.3 Semantics

Semantics of the `FlashCapabilityType` type:

Name	*Definition*

IECNORM.COM : Click to view the full PDF of ISO/IEC 23005-2:2013

© ISO/IEC 2013 – All rights reserved

Name	*Definition*
FlashCapabilityType	Tool for describing a flash capability. It is extended from the light capability type.
maxFrequencyFlag	This field, which is only present in the binary representation, signals the presence of the activation attribute. A value of "1" means the attribute shall be used and "0" means the attribute shall not be used.
numOfFreqLevelsFlag	This field, which is only present in the binary representation, signals the presence of the activation attribute. A value of "1" means the attribute shall be used and "0" means the attribute shall not be used.
LightCapability	Describes a light capability.
maxFrequency	Describes the maximum number of flickering in times per second. EXAMPLE The value 10 means the device can flicker 10 times for each second.
maxIntensity	Describes the maximum intensity that the flash device can provide in terms of LUX.
unit	Specifies the unit of the maxIntensity, if a unit other than the default unit is used, as a reference to a classification scheme term provided by UnitTypeCS defined in A.2.1 of ISO/IEC 23005-6.
numOfFreqLevels	Describes the number of frequency levels that the device can provide in between maximum and minimum frequency.
numOfLightLevels	Describes the number of intensity levels that the device can provide in between maximum and minimum intensity of light.

IECNORM.COM : Click to view the full PDF of ISO/IEC 23005-2:2013

5.4.4 Examples

This example shows the description of a flash light capability with the following semantics. The flash light identifier is “flash1”. The maximum frequency of the flash light is 50 times per second. There are 10 levels between maximum and minimum frequency of the flash light. The location of the flash light is the left side according to the position model described in Figure 3 of ISO/IEC 23005-3.

```
<cidl:SensoryDeviceCapability xsi:type="dcdv:FlashCapabilityType" id="flash1"
maxFrequency="50" numOfFreqLevels="10"
unit="urn:mpeg:mpeg-v:01-CI-UnitTypeCS-NS:lux" maxIntensity="300"
numOfLightLevels="10" locator="urn:mpeg:mpeg-v:01-SI-LocationCS-NS:left"/>
```

5.5 Heating capability type

5.5.1 XML representation syntax

```
<!-- ################################################ -->
<!--  Heating capability type                         -->
<!-- ################################################ -->
<complexType name="HeatingCapabilityType">
   <complexContent>
```


© ISO/IEC 2013 – All rights reserved

```
        <extension base="cidl:SensoryDeviceCapabilityBaseType">
            <attribute name="maxIntensity" type="nonNegativeInteger"
                use="optional"/>
            <attribute name="minIntensity" type="integer" use="optional"/>
            <attribute name="unit" type="mpegvct:unitType" use="optional"/>
            <attribute name="numOfLevels" type="nonNegativeInteger"
                use="optional"/>
        </extension>
    </complexContent>
</complexType>
```

5.5.2 Binary representation syntax

HeatingCapabilityType {	**(Number of bits)**	**(Mnemonic)**
maxIntensityFlag	1	bslbf
minIntensityFlag	1	bslbf
unitFlag	1	bslbf
numOfLevelsFlag	1	bslbf
SensoryDeviceCapabilityBase		SensoryDeviceCapabilityBaseType
if(maxIntensityFlag){		
maxIntensity	16	uimsbf
}		
if(minIntensityFlag){		
minIntensity	8	uimsbf
}		
if(unitFlag){		
unit	8	bslbf
}		
if(numOfLevelsFlag){		
numOfLevels	16	uimsbf
}		
}		

IECNORM.COM : Click to view the full PDF of ISO/IEC 23005-2:2013

5.5.3 Semantics

Semantics of the `HeatingCapabilityType` type:

© ISO/IEC 2013 – All rights reserved

Name	*Definition*
`HeatingCapabilityType`	Tool for describing the capability of a device which can increae the room temperature.
`maxIntensityFlag`	This field, which is only present in the binary representation, signals the presence of the activation attribute. A value of ”1” means the attribute shall be used and ”0” means the attribute shall not be used.
`minIntensityFlag`	This field, which is only present in the binary representation, signals the presence of the activation attribute. A value of ”1” means the attribute shall be used and ”0” means the attribute shall not be used.
`unitFlag`	This field, which is only present in the binary representation, signals the presence of the activation attribute. A value of ”1” means the attribute shall be used and ”0” means the attribute shall not be used.
`numOfLevelsFlag`	This field, which is only present in the binary representation, signals the presence of the activation attribute. A value of ”1” means the attribute shall be used and ”0” means the attribute shall not be used.
`maxIntensity`	Describes the highest temperature that the heating device can provide in terms of Celsius (or Fahrenheit).
`minIntensity`	Describes the lowest temperature that the heating device can provide in terms of Celsius (or Fahrenheit).
`unit`	Specifies the unit of the intensity, as a reference to a classification scheme term provided by UnitTypeCS defined in A.2.1 of ISO/IEC 23005-6 (it shall be a reference to either Celsius or Fahrenheit.) If the unit is not specified, the default unit is Celsius.
`numOfLevels`	Describes the number of temperature levels that the device can provide in between maximum and minimum temperature.

IECNORM.COM : Click to view the full PDF of ISO/IEC 23005-2:2013

5.5.4 Examples

This example shows the description of a heating capability with the following semantics. The heating device identifier is “heater1”. The maximum intensity of the heating device is 40 degrees Celsius, and the minimum intensity is 20 degrees Celsius. This specified device can support 40 levels in controlling the intensity. This device takes 10 milliseconds to start and 20 milliseconds to reach the target intensity. The location of the heating device is the left side according to the position model described in Figure 3 of ISO/IEC 23005-3.

```
<cidl:SensoryDeviceCapability xsi:type="dcdv:HeatingCapabilityType"
id="heater1" zerothOrderDelayTime="10" firstOrderDelayTime="20"
maxIntensity="40" minIntensity="20" numOfLevels="40"
locator="urn:mpeg:mpeg-v:01-SI-LocationCS-NS:left"/>
```

5.6 Cooling capability type

5.6.1 XML representation syntax

```
<!-- ################################################ -->
<!--  Cooling capability type                         -->
<!-- ################################################ -->
```


© ISO/IEC 2013 – All rights reserved

```
<complexType name="CoolingCapabilityType">
   <complexContent>
      <extension base="cidl:SensoryDeviceCapabilityBaseType">
         <attribute name="maxIntensity" type="integer" use="optional"/>
         <attribute name="minIntensity" type="nonNegativeInteger"
            use="optional"/>
         <attribute name="unit" type="mpegvct:unitType" use="optional"/>
         <attribute name="numOfLevels" type="nonNegativeInteger"
            use="optional"/>
      </extension>
   </complexContent>
</complexType>
```

5.6.2 Binary representation syntax

CoolingCapabilityType {	**(Number of bits)**	**(Mnemonic)**
maxIntensityFlag	1	bslbf
minIntensityFlag	1	bslbf
unitFlag	1	bslbf
numOfLevelsFlag	1	bslbf
SensoryDeviceCapabilityBase		SensoryDeviceCapabilityBaseType
if(maxIntensityFlag){		
maxIntensity	16	simsbf
}		
if(minIntensityFlag){		
minIntensity	8	uimsbf
}		
if(unitFlag){		
unit	8	bslbf
}		
if(numOfLevelsFlag){		
numOfLevels	16	uimsbf
}		
}		

5.6.3 Semantics

Semantics of the `CoolingCapabilityType` type:

Name	*Definition*

IECNORM.COM : Click to view the full PDF of ISO/IEC 23005-2:2013

© ISO/IEC 2013 – All rights reserved

Name	*Definition*
CoolingCapabilityType	Tool for describing the capability of a device which can decrease the room temperature.
maxIntensityFlag	This field, which is only present in the binary representation, signals the presence of the activation attribute. A value of ”1” means the attribute shall be used and ”0” means the attribute shall not be used.
minIntensityFlag	This field, which is only present in the binary representation, signals the presence of the activation attribute. A value of ”1” means the attribute shall be used and ”0” means the attribute shall not be used.
unitFlag	This field, which is only present in the binary representation, signals the presence of the activation attribute. A value of ”1” means the attribute shall be used and ”0” means the attribute shall not be used.
numOfLevelsFlag	This field, which is only present in the binary representation, signals the presence of the activation attribute. A value of ”1” means the attribute shall be used and ”0” means the attribute shall not be used.
maxIntensity	Describes the lowest temperature that the cooling device can provide in terms of Celsius.
minIntensity	Describes the highest temperature that the cooling device can provide in terms of Celsius.
unit	Specifies the unit of the intensity, as a reference to a classification scheme term provided by UnitTypeCS defined in A.2.1 of ISO/IEC 23005-6 (it shall be a reference to either Celsius or Fahrenheit.) If the unit is not specified, the default unit is Celsius.
numOfLevels	Describes the number of temperature levels that the device can provide in between maximum and minimum temperature.

IECNORM.COM : Click to view the full PDF of ISO/IEC 23005-2:2013

5.6.4 Examples

This example shows the description of a heating capability with the following semantics. The heating device identifier is “cooler1”. The maximum intensity of the cooling device is 15 degrees Celsius, and the minimum intensity is 30 degrees Celsius. This specified device can support 30 levels in controlling the intensity. This device takes 10 milliseconds to start and 30 milliseconds to reach the target intensity. The location of the heating device is the right side according to the position model described in Figure 3 of ISO/IEC 23005-3.

```
<cidl:SensoryDeviceCapability xsi:type="dcdv:CoolingCapabilityType"
id="cooler1" zerothOrderDelayTime="10" firstOrderDelayTime="30"
maxIntensity="15" minIntensity="30" numOfLevels="30"
locator="urn:mpeg:mpeg-v:01-SI-LocationCS-NS:right"/>
```

5.7 Wind capability type

5.7.1 XML representation syntax

```
<!-- ################################################ -->
<!-- Wind capability type                             -->
<!-- ################################################ -->
```


© ISO/IEC 2013 – All rights reserved

```
<complexType name="WindCapabilityType">
   <complexContent>
      <extension base="cidl:SensoryDeviceCapabilityBaseType">
         <attribute name="maxWindSpeed" type="nonNegativeInteger"
            use="optional"/>
         <attribute name="unit" type="mpegvct:unitType" use="optional"/>
         <attribute name="numOfLevels" type="nonNegativeInteger"
            use="optional"/>
      </extension>
   </complexContent>
</complexType>
```

5.7.2 Binary representation syntax

WindCapabilityType {	**(Number of bits)**	**(Mnemonic)**
maxWindSpeedFlag	1	bslbf
unitFlag	1	bslbf
numOfLevelsFlag	1	bslbf
SensoryDeviceCapabilityBase		SensoryDeviceCapabilityBaseType
if(maxWindSpeedFlag){		
maxWindSpeed	16	uimsbf
}		
if(unitFlag){		
unit	8	bslbf
}		
if(numOfLevelsFlag){		
numOfLevels	16	uimsbf
}		
}		

IECNORM.COM : Click to view the full PDF of ISO/IEC 23005-2:2013

5.7.3 Semantics

Semantics of the `WindCapabilityType` type:

Name	*Definition*
`WindCapabilityType`	Tool for describing a wind capability.

© ISO/IEC 2013 – All rights reserved

Name	*Definition*
maxWindSpeedFlag	This field, which is only present in the binary representation, signals the presence of the activation attribute. A value of ”1” means the attribute shall be used and ”0” means the attribute shall not be used.
unitFlag	This field, which is only prsent in the binary representation, signals the presence of the activation attribute. A value of ”1” means the attribute shall be used and ”0” means the attribute shall not be used.
numOfLevelsFlag	This field, which is only present in the binary representation, signals the presence of the activation attribute. A value of ”1” means the attribute shall be used and ”0” means the attribute shall not be used.
maxWindSpeed	Describes the maximum wind speed that the fan can provide in terms of Meter per second.
unit	Specifies the unit of the intensity, if a unit other than the default unit specified in the semantics of the maxWindSpeed is used, as a reference to a classification scheme term provided by UnitTypeCS defined in A.2.1 of ISO/IEC 23005-6.
numOfLevels	Describes the number of wind speed levels that the device can provide in between maximum and minimum speed.

5.7.4 Examples

This example shows the description of a wind device capability with the following semantics. The wind device identifier is “fan01”. The maximum wind speed of the wind device (possibly a fan) is 30 meter per second. This specified device can support 5 levels in controlling the wind speed. This device takes 10 milliseconds to start and 10 milliseconds to reach the target intensity. The location of the heating device is the center according to the position model described in Figure 3 of ISO/IEC 23005-3.

```
<cidl:SensoryDeviceCapability xsi:type="dcdv:WindCapabilityType"
id="fan01" zerothOrderDelayTime="10" firstOrderDelayTime="10"
maxWindSpeed="30" numOfLevels="5" locator="urn:mpeg:mpeg-v:01-SI-
LocationCS-NS:center"/>
```

5.8 Vibration capability type

5.8.1 XML representation syntax

```
<!-- ################################################ -->
<!--  Vibration capability type                       -->
<!-- ################################################ -->
<complexType name="VibrationCapabilityType">
   <complexContent>
      <extension base="cidl:SensoryDeviceCapabilityBaseType">
```

IECNORM.COM : Click to view the full PDF of ISO/IEC 23005-2:2013

© ISO/IEC 2013 – All rights reserved

```
            <attribute name="maxIntensity" type="nonNegativeInteger"
               use="optional"/>
            <attribute name="unit" type="mpegvct:unitType" use="optional"/>
            <attribute name="numOfLevels" type="nonNegativeInteger"
               use="optional"/>
         </extension>
      </complexContent>
</complexType>
```

5.8.2 Binary representation syntax

VibrationCapabilityType {	**(Number of bits)**	**(Mnemonic)**
maxIntensityFlag	1	Bslbf
unitFlag	1	Bslbf
numOfLevelsFlag	1	Bslbf
SensoryDeviceCapabilityBase		SensoryDeviceCapabilityBaseType
if(maxIntensityFlag){		
maxIntensity	16	uimsbf
}		
if(unitFlag){		
unit	8	bslbf
}		
if(numOfLevelsFlag){		
numOfLevels	16	uimsbf
}		
}		

IECNORM.COM : Click to view the full PDF of ISO/IEC 23005-2:2013

5.8.3 Semantics

Semantics of the `VibrationCapabilityType` type:

Name	*Definition*
`VibrationCapabilityType`	Tool for describing a vibration capability.
`maxIntensityFlag`	This field, which is only present in the binary representation, signals the presence of the activation attribute. A value of ”1” means the attribute shall be used and ”0” means the attribute shall not be used.

© ISO/IEC 2013 – All rights reserved

Name	*Definition*
`unitFlag`	This field, which is only present in the binary representation, signals the presence of the activation attribute. A value of ”1” means the attribute shall be used and ”0” means the attribute shall not be used.
`numOfLevelsFlag`	This field, which is only present in the binary representation, signals the presence of the activation attribute. A value of ”1” means the attribute shall be used and ”0” means the attribute shall not be used.
`maxIntensity`	Describes the maximum intensity that the vibrator device can provide in terms of Hertz.
`unit`	Specifies the unit of the intensity, if a unit other than the default unit specified in the semantics of the maxIntensity is used, as a reference to a classification scheme term provided by UnitTypeCS defined in A.2.1 of ISO/IEC 23005-6.
`numOfLevels`	Describes the number of intensity levels that the device can provide in between zero and maximum intensity.

5.8.4 Examples

This example shows the description of a vibration device capability with the following semantics. The vibration device identifier is “vib001”. The maximum intensity of the vibration device is 600 Hz. This specified device can support 4 levels in controlling the intensity. This device takes 0 milliseconds to start and 10 milliseconds to reach the target intensity. The location of the heating device is the center side according to the position model described in Figure 3 of ISO/IEC 23005-3.

```
<cidl:SensoryDeviceCapability xsi:type="dcdv:VibrationCapabilityType"
id="vib001" zerothOrderDelayTime="0" firstOrderDelayTime="10"
maxIntensity="600" numOfLevels="4" locator="urn:mpeg:mpeg-v:01-SI-
LocationCS-NS:center"/>
```

5.9 Scent capability type

5.9.1 XML representation syntax

```
<!-- ################################################ -->
<!--  Scent capability type                           -->
<!-- ################################################ -->
<complexType name="ScentCapabilityType">
   <complexContent>
      <extension base="cidl:SensoryDeviceCapabilityBaseType">
         <sequence>
            <element name="Scent" type="mpeg7:termReferenceType" minOccurs="0"
               maxOccurs="unbounded"/>
         </sequence>
         <attribute name="maxIntensity" type="nonNegativeInteger"
               use="optional"/>
         <attribute name="unit" type="mpegvct:unitType" use="optional"/>
         <attribute name="numOfLevels" type="nonNegativeInteger"
               use="optional"/>
```

IECNORM.COM : Click to view the full PDF of ISO/IEC 23005-2:2013

© ISO/IEC 2013 – All rights reserved

```
        </extension>
    </complexContent>
</complexType>
```

5.9.2 Binary representation syntax

ScentCapabilityType {	(Number of bits)	(Mnemonic)
ScentFlag	1	Bslbf
maxIntensityFlag	1	Bslbf
unitFlag	1	Bslbf
numOfLevelsFlag	1	Bslbf
SensoryDeviceCapabilityBase		SensoryDeviceCapabilityBaseType
if(ScentFlag){		
LoopScent		vluimsbf5
for(k=0;k<LoopScent;k++){		
Scent[k]	8	blsbf
}		
}		
if(maxIntensityFlag){		
maxIntensity	16	uimsbf
}		
if(unitFlag){		
unit	8	bslbf
}		
if(numOfLevelsFlag){		
numOfLevels	16	uimsbf
}		
}		

5.9.3 Semantics

Semantics of the `ScentCapabilityType` type:

IECNORM.COM : Click to view the full PDF of ISO/IEC 23005-2:2013

© ISO/IEC 2013 – All rights reserved

Name	*Definition*
ScentCapabilityType	Tool for describing a scent capability.
ScentFlag	This field, which is only present in the binary representation, signals the presence of the activation attribute. A value of ”1” means the attribute shall be used and ”0” means the attribute shall not be used.
maxIntensityFlag	This field, which is only present in the binary representation, signals the presence of the activation attribute. A value of ”1” means the attribute shall be used and ”0” means the attribute shall not be used.
unitFlag	This field, which is only present in the binary representation, signals the presence of the activation attribute. A value of ”1” means the attribute shall be used and ”0” means the attribute shall not be used.
numOfLevelsFlag	This field, which is only present in the binary representation, signals the presence of the activation attribute. A value of ”1” means the attribute shall be used and ”0” means the attribute shall not be used.
LoopScent	This field, which is only present in the binary representation, specifies the number of Scent contained in the description.
Scent	Describes the list of scent that the perfumer can provide. The type of the scent shall be described using the mpeg7:termReferenceType defined in 7.6 of ISO/IEC 15938-5:2003. A CS that may be used for this purpose is the ScentCS defined in A.2.4 of ISO/IEC 23005-6. In the binary description, the following mapping table is used,

ScentTypeCS	**Term ID of scent**
00000000	Rose
00000001	Acacia
00000010	Chrysanthemum
00000011	Lilac
00000100	Mint
00000101	Jasmine
00000110	pine_tree
00000111	Orange
00001000	Grape
00001001-11111111	Reserved

maxIntensity	Describes the maximum intensity that the perfumer can provide in terms of ml/h.
unit	Specifies the unit of the intensity, if a unit other than the default unit specified in the semantics of the maxIntensity is used, as a reference to a classification scheme term provided by UnitTypeCS defined in A.2.1 of ISO/IEC 23005-6. The

IECNORM.COM : Click to view the full PDF of ISO/IEC 23005-2:2013

© ISO/IEC 2013 – All rights reserved

Name	*Definition*
	reference to the classification scheme shall be done using the `mpeg7:termReferenceType` defined in 7.6 of ISO/IEC 15938-5:2003.
`numOfLevels`	Describes the number of intensity levels of the scent that the device can provide in between zero and maximum intensity.

5.9.4 Examples

This example shows the description of a scent device capability with the following semantics. The scent device identifier is "scent01". The maximum intensity of the scent amount is 5 millilitres per hour with two levels of control. As this device takes 0 milliseconds to start and 0 milliseconds to reach the target intensity, it is not specified explicitly. The location of the scent device is the center side according to the position model described in Figure 3 of ISO/IEC 23005-3. The type of scent is rose according to the ScentCS specified in A2.4 of ISO/IEC 23005-6.

```
<cidl:SensoryDeviceCapability xsi:type="dcdv:ScentCapabilityType"
id="scent01" maxIntensity="5" numOfLevels="2" locator="urn:mpeg:mpeg-v:01-
SI-LocationCS-NS:center">
   <dcdv:Scent>urn:mpeg:mpeg-v:01-SI-ScentCS-NS:rose</dcdv:Scent>
</cidl:SensoryDeviceCapability>
```

5.10 Fog capability type

5.10.1 XML representation syntax

```
<!-- ################################################ -->
<!--  Fog capability type                             -->
<!-- ################################################ -->
<complexType name="FogCapabilityType">
   <complexContent>
      <extension base="cidl:SensoryDeviceCapabilityBaseType">
         <attribute name="maxIntensity" type="nonNegativeInteger"
            use="optional"/>
         <attribute name="unit" type="mpegvct:unitType" use="optional"/>
         <attribute name="numOfLevels" type="nonNegativeInteger"
            use="optional"/>
      </extension>
   </complexContent>
</complexType>
```

5.10.2 Binary representation syntax

FogCapabilityType {	**(Number of bits)**	**(Mnemonic)**
maxIntensityFlag	1	Bslbf
unitFlag	1	Bslbf
numOfLevelsFlag	1	Bslbf

IECNORM.COM : Click to view the full PDF of ISO/IEC 23005-2:2013

© ISO/IEC 2013 – All rights reserved

FogCapabilityType {	**(Number of bits)**	**(Mnemonic)**
SensoryDeviceCapabilityBase		SensoryDeviceCapabilityBaseType
if(maxIntensityFlag){		
maxIntensity	16	uimsbf
}		
if(unitFlag){		
unit	8	bslbf
}		
if(numOfLevelsFlag){		
numOfLevels	16	uimsbf
}		
}		

5.10.3 Semantics

Semantics of the `FogCapabilityType` type:

Name	*Definition*
`FogCapabilityType`	Tool for describing a fog capability.
`maxIntensityFlag`	This field, which is only present in the binary representation, signals the presence of the activation attribute. A value of ”1” means the attribute shall be used and ”0” means the attribute shall not be used.
`unitFlag`	This field, which is only present in the binary representation, signals the presence of the activation attribute. A value of ”1” means the attribute shall be used and ”0” means the attribute shall not be used.
`numOfLevelsFlag`	This field, which is only present in the binary representation, signals the presence of the activation attribute. A value of ”1” means the attribute shall be used and ”0” means the attribute shall not be used.
`maxIntensity`	Describes the maximum intensity that the fog device can provide in terms of ml/h.
`unit`	Specifies the unit of the intensity, if a unit other than the default unit specified in the semantics of the maxIntensity is used, as a reference to a classification scheme term provided by UnitTypeCS defined in A.2.1 of ISO/IEC 23005-6. The reference to the classification scheme shall be done using the `mpeg7:termReferenceType` defined in 7.6 of ISO/IEC 15938-5:2003.
`numOfLevels`	Describes the number of intensity levels of the fog that the device can provide in between zero and maximum intensity.

IECNORM.COM : Click to view the full PDF of ISO/IEC 23005-2:2013

© ISO/IEC 2013 – All rights reserved

5.10.4 Examples

This example shows the description of a fog device capability with the following semantics. The fog device identifier is “fog11”. The maximum intensity of the fog amount is 100 millilitres per hour with five levels of control. This device takes 30 milliseconds to start and 100 milliseconds to reach the target intensity. The location of the scent device is the back side according to the position model described in Figure 3 of ISO/IEC 23005-3.

```
<cidl:SensoryDeviceCapability xsi:type="dcdv:FogCapabilityType" id="fog11"
zerothOrderDelayTime="30" firstOrderDelayTime="100" maxIntensity="100"
numOfLevels="5" locator="urn:mpeg:mpeg-v:01-SI-LocationCS-NS:back"/>
```

5.11 Sprayer capability type

5.11.1 XML representation syntax

```
<!-- ################################################ -->
<!--  Sprayer capability type                         -->
<!-- ################################################ -->
<complexType name="SprayerCapabilityType">
   <complexContent>
      <extension base="cidl:SensoryDeviceCapabilityBaseType">
         <attribute name="sprayingType" type="mpeg7:termReferenceType"/>
         <attribute name="maxIntensity" type="nonNegativeInteger"
            use="optional"/>
         <attribute name="unit" type="mpegvct:unitType" use="optional"/>
         <attribute name="numOfLevels" type="nonNegativeInteger"
            use="optional"/>
      </extension>
   </complexContent>
</complexType>
```

5.11.2 Binary representation syntax

SprayerCapabilityType {	**(Number of bits)**	**(Mnemonic)**
sprayingFlag	1	bslbf
maxIntensityFlag	1	bslbf
unitFlag	1	bslbf
numOfLevelsFlag	1	bslbf
SensoryDeviceCapabilityBase		SensoryDeviceCapabilityBaseType
if(sprayingFlag) {		
spraying	8	blsbf
}		
if(maxIntensityFlag){		

IECNORM.COM : Click to view the full PDF of ISO/IEC 23005-2:2013

© ISO/IEC 2013 – All rights reserved

SprayerCapabilityType {	**(Number of bits)**	**(Mnemonic)**
maxIntensity	16	uimsbf
}		
if(unitFlag){		
unit	8	bslbf
}		
if(numOfLevelsFlag){		
numOfLevels	16	uimsbf
}		
}		

5.11.3 Semantics

Semantics of the `SprayerCapabilityType` type:

Name	*Definition*
`SprayerCapabilityType`	Tool for describing a water sprayer capability.
`sprayingFlag`	This field, which is only present in the binary representation, signals the presence of the activation attribute. A value of "1" means the attribute shall be used and "0" means the attribute shall not be used.
`maxIntensityFlag`	This field, which is only present in the binary representation, signals the presence of the activation attribute. A value of "1" means the attribute shall be used and "0" means the attribute shall not be used.
`unitFlag`	This field, which is only present in the binary representation, signals the presence of the activation attribute. A value of "1" means the attribute shall be used and "0" means the attribute shall not be used.
`numOfLevelsFlag`	This field, which is only present in the binary representation, signals the presence of the activation attribute. A value of "1" means the attribute shall be used and "0" means the attribute shall not be used.

IECNORM.COM : Click to view the full PDF of ISO/IEC 23005-2:2013

© ISO/IEC 2013 – All rights reserved

spraying	Describes the type of the material that the sprayer can spray as a reference to a classification scheme term. The reference to the classification scheme shall be done using the mpeg7:termReferenceType defined in 7.6 of ISO/IEC 15938-5:2003. A CS that may be used for this purpose is the SprayingTypeCS defined in A.2.7 of ISO/IEC 23005-6. In the binary description, the following mapping table is used, **SprayingTypeCS** / **Term ID of Spraying** 00000000 / water 00000001-11111111 / Reserved
maxIntensity	Describes the maximum intensity that the water sprayer can provide in terms of ml/h.
unit	Specifies the unit of the intensity, if a unit other than the default unit specified in the semantics of the maxIntensity is used, as a reference to a classification scheme term provided by UnitTypeCS defined in A.2.1 of ISO/IEC 23005-6. The reference to the classification scheme shall be done using the mpeg7:termReferenceType defined in 7.6 of ISO/IEC 15938-5:2003.
numOfLevels	Describes the number of intensity levels of the fog that the device can provide in between zero and maximum intensity.

5.11.4 Examples

This example shows the description of a sprayer device capability with the following semantics. The sprayer device identifier is “spryr00”. The maximum intensity of the spraying amount is 10 millilitres per hour with three levels of control. This device takes 5 milliseconds to start and 5 milliseconds to reach the target intensity. The location of the sprayer device is the midway side according to the position model described in Figure 3 of ISO/IEC 23005-3.

```
<cidl:SensoryDeviceCapability xsi:type="dcdv:SprayerCapabilityType"
id="spryr00" sprayingType="urn:mpeg:mpeg-v:01-SI-SprayingTypeCS-NS:water"
zerothOrderDelayTime="5" firstOrderDelayTime="5" maxIntensity="10"
numOfLevels="3" locator="urn:mpeg:mpeg-v:01-SI-LocationCS-NS:midway"/>
```

IECNORM.COM : Click to view the full PDF of ISO/IEC 23005-2:2013

5.12 Color correction capability type

5.12.1 XML representation syntax

```
<!-- ################################################ -->
<!-- Color Correction capability type                 -->
<!-- ################################################ -->
<complexType name="ColorCorrectionCapabilityType">
   <complexContent>
      <extension base="cidl:SensoryDeviceCapabilityBaseType">
         <attribute name="flag" type="boolean" use="optional" default="false"/>
      </extension>
```

© ISO/IEC 2013 – All rights reserved

```
    </complexContent>
</complexType>
```

5.12.2 Binary representation syntax

ColorCorrectionCapabilityType {	**(Number of bits)**	**(Mnemonic)**
flagFlag	1	bslbf
SensoryDeviceCapabilityBase		SensoryDeviceCapabilityBaseType
if(flagFlag) {		
flag	1	bslbf
}		
}		

5.12.3 Semantics

Semantics of the `ColorCorrectionCapabilityType` type:

Name	*Definition*
`ColorCorrectionCapabilityType`	Tool for describing if the given device has a color correction capability.
`flagFlag`	This field, which is only present in the binary representation, signals the presence of the activation attribute. A value of ”1” means the attribute shall be used and ”0” means the attribute shall not be used.
`flag`	Describes the existence of the color correction capability of the given device in terms of “true” and “false”.

5.12.4 Examples

This example shows the description of a color correction capability with the following semantics. Since the Flag is “true”, the device “tv1” is equipped with a capability of color correction.

```
<cidl:SensoryDeviceCapability       xsi:type="dcdv:ColorCorrectionCapabilityType"
flag="true" id="tv1"/>
```

5.13 Tactile capability type

5.13.1 XML representation syntax

```
<!-- ################################################ -->
```

IECNORM.COM : Click to view the full PDF of ISO/IEC 23005-2:2013

© ISO/IEC 2013 – All rights reserved

```
<!--  Tactile capability type                                  -->
<!-- ########################################################## -->
<complexType name="TactileCapabilityType">
   <complexContent>
      <extension base="cidl:SensoryDeviceCapabilityBaseType">
         <attribute name="intensityUnit" type="mpegvct:unitType"
            use="optional"/>
         <attribute name="maxValue" type="nonNegativeInteger" use="optional"/>
         <attribute name="minValue" type="nonNegativeInteger" use="optional"/>
         <attribute name="arraysizeX" type="nonNegativeInteger"/>
         <attribute name="arraysizeY" type="nonNegativeInteger"/>
         <attribute name="gapX" type="float" use="optional"/>
         <attribute name="gapY" type="float" use="optional"/>
         <attribute name="gapUnit" type="mpegvct:unitType" use="optional"/>
         <attribute name="maxUpdateRate" type="nonNegativeInteger"
            use="optional"/>
         <attribute name="updateRateUnit" type="mpegvct:unitType"
            use="optional"/>
         <attribute name="actuatorType" type="mpeg7:termReferenceType"
            use="optional"/>
         <attribute name="numOfLevels" type="nonNegativeInteger"
            use="optional"/>
      </extension>
   </complexContent>
</complexType>
```

5.13.2 Binary representation syntax

TactileCapabilityType {	(Number of bits)	(Mnemonic)
intensityUnitFlag	1	bslbf
maxValueFlag	1	bslbf
minValueFlag	1	bslbf
arraysizeXFlag	1	bslbf
arraysizeYFlag	1	bslbf
gapXFlag	1	bslbf
gapYFlag	1	bslbf
gapUnitFlag	1	bslbf
maxUpdateRateFlag	1	bslbf
updateRateUnitFlag	1	bslbf
actuatorTypeFlag	1	bslbf
numOfLevelsFlag	1	bslbf
extendArraySizeFlag	1	bslbf

IECNORM.COM : Click to view the full PDF of ISO/IEC 23005-2:2013

© ISO/IEC 2013 – All rights reserved

TactileCapabilityType {	**(Number of bits)**	**(Mnemonic)**
SensoryDeviceCapabilityBase		SensoryDeviceCapabilityBaseType
if(intensityUnitFlag) {		
intensityUnit	8	bslbf
}		
if(maxValueFlag){		
maxValue	16	uimsbf
}		
if(minValueFlag){		
minValue	16	uimsbf
}		
if(arraysizeXFlag){		
if(extendArraySizeFlag){		
arraysizeX	16	uimsbf
}		
else {		
arraysizeX	8	uimsbf
}		
}		
if(arraysizeYFlag){		
if(extendArraySizeFlag){		
arraysizeY	16	uimsbf
}		
else {		
arraysizeY	8	uimsbf
}		
}		
if(gapXFlag){		

IECNORM.COM : Click to view the full PDF of ISO/IEC 23005-2:2013

© ISO/IEC 2013 – All rights reserved

TactileCapabilityType {	**(Number of bits)**	**(Mnemonic)**
gapX	32	fsbf
}		
if(gapYFlag){		
gapY	32	fsbf
}		
if(gapUnitFlag){		
gapUnit	8	bslbf
}		
if(maxUpdateRateFlag){		
maxUpdateRate	16	uimsbf
}		
if(updateRateUnitFlag){		
updateRateUnit	8	bslbf
}		
if(actuatorTypeFlag){		
actuatorType	4	blsbf
}		
if(numOfLevelsFlag){		
numOfLevels	16	uimsbf
}		
}		

IECNORM.COM : Click to view the full PDF of ISO/IEC 23005-2:2013

5.13.3 Semantics

Semantics of the `TactileCapabilityType`:

Name	*Definition*
`TactileCapabilityType`	Tool for describing a tactile device capability.
`intensityUnitFlag`	This field, which is only present in the binary representation, signals the presence of the activation attribute. A value of "1" means the attribute shall

© ISO/IEC 2013 – All rights reserved

Name	*Definition*
	be used and ”0” means the attribute shall not be used.
maxValueFlag	This field, which is only present in the binary representation, signals the presence of the activation attribute. A value of ”1” means the attribute shall be used and ”0” means the attribute shall not be used.
minValueFlag	This field, which is only present in the binary representation, signals the presence of the activation attribute. A value of ”1” means the attribute shall be used and ”0” means the attribute shall not be used.
arraysizeXFlag	This field, which is only present in the binary representation, signals the presence of the activation attribute. A value of ”1” means the attribute shall be used and ”0” means the attribute shall not be used.
arraysizeYFlag	This field, which is only present in the binary representation, signals the presence of the activation attribute. A value of ”1” means the attribute shall be used and ”0” means the attribute shall not be used.
gapXFlag	This field, which is only present in the binary representation, signals the presence of the activation attribute. A value of ”1” means the attribute shall be used and ”0” means the attribute shall not be used.
gapYFlag	This field, which is only present in the binary representation, signals the presence of the activation attribute. A value of ”1” means the attribute shall be used and ”0” means the attribute shall not be used.
gapUnitFlag	This field, which is only present in the binary representation, signals the presence of the activation attribute. A value of ”1” means the attribute shall be used and ”0” means the attribute shall not be used.
maxUpdateRateFlag	This field, which is only present in the binary representation, signals the presence of the activation attribute. A value of ”1” means the attribute shall be used and ”0” means the attribute shall not be used.
updateRateUnitFlag	This field, which is only present in the binary representation, signals the presence of the activation attribute. A value of ”1” means the attribute shall be used and ”0” means the attribute shall not be used.
actuatorTypeFlag	This field, which is only present in the binary representation, signals the presence of the activation attribute. A value of ”1” means the attribute shall be used and ”0” means the attribute shall not be used.
numOfLevelsFlag	This field, which is only present in the binary representation, signals the presence of the activation attribute. A value of ”1” means the attribute shall be used and ”0” means the attribute shall not be used.
extendArraySizeFlag	This field, which is only present in the binary representation, signals the presence of the activation attribute. A value of ”1” means the attribute shall be used and ”0” means the attribute shall not be used.
intensityUnit	Specifies the unit of the intensity for maxValue and minValue, as a reference to a classification scheme term provided by UnitTypeCS defined in A.2.1 of ISO/IEC 23005-6. There is no default unit specified as the intensityUnit may vary depending on the type of the actuator used for the Tactile device. For example, when an electrotactile device is selected the unit can be mA. For a pneumatic tactile device, the unit may be either psi or Pa; for a vibrotactile device, the unit may be hz (frequency), or mm (amplitude); for a thermal

IECNORM.COM : Click to view the full PDF of ISO/IEC 23005-2:2013

© ISO/IEC 2013 – All rights reserved

Name	*Definition*
	display, the unit may be either Celsius or Fahrenheit.
maxValue	Describes the maximum intensity that a tactile device can drive in the unit specified by the intensityUnit attribute.
minValue	Describes the minimum intensity that a tactile device can drive in the unit specified by the intensityUnit attribute.
arraysizeX	Describes a number of actuators in X (horizontal) direction since a tactile device is formed as m-by-n array types. (integer)
arraysizeY	Describes a number of actuators in Y (vertical) direction since a tactile device is formed as m-by-n array types. (integer)
gapX	Describes the X directional gap space between actuators in a tactile device.(mm)
gapY	Describes the Y directional gap space between actuators in a tactile device.(mm)
gapUnit	Specifies the unit of the description of gapX and gapY attributes as a reference to a classification scheme term provided by UnitTypeCS defined in A.2.1 of ISO/IEC 23005-6, if any unit other than the default unit of mm is used. The reference to the classification scheme shall be done using the mpeg7:termReferenceType defined in 7.6 of ISO/IEC 15938-5:2003.
maxUpdateRate	Describes a maximum update rate that a tactile device can drive.
updateRateUnit	Specifies the unit of the description of maxUpdateRate as a reference to a classification scheme term provided by UnitTypeCS defined in A.2.1 of ISO/IEC 23005-6, if any unit other than the default unit of Hz is used. The reference to the classification scheme shall be done using the mpeg7:termReferenceType defined in 7.6 of ISO/IEC 15938-5:2003.
actuatorType	Describes a type of tactile device (e.g. vibrating motor, electrotactile device, pneumatic device, piezoelectric device, thermal device, etc) as a reference to a classification scheme. The reference to the classification scheme shall be done using the mpeg7:termReferenceType defined in 7.6 of ISO/IEC 15938-5:2003. A CS that may be used for this purpose is the TactileDisplayCS defined in A.2.11 of ISO/IEC 23005-6. In the binary description, the following mapping table is used,

TactileDisplayCS	**Term ID of TactileDisplay**
0000	vibrotactile
0001	electrotactile
0010	pneumatictactile
0011	piezoelectrictactile
0100	thermal

IECNORM.COM : Click to view the full PDF of ISO/IEC 23005-2:2013

© ISO/IEC 2013 – All rights reserved

Name	*Definition*		
	0101-1111	Reserved	
numOfLevels	Describes the number of intensity levels that a tactile device can drive.		

5.13.4 Examples

The following is an example of the TactileCapabilityType to indicate that the specified device can display tactile information. This example shows the description of tactile device capabilities and its features. Among several tactile devices, a thermal device with 10-by-4 array is selected. In the array, each thermal element locates with a 5 mm gap and maximum temperature the thermal display can generate is 34 degree in Celsius and the minimum is 16 degree. Each thermal element drives 8 different levels and the temperature new temperature presented can be updated up to 10 times per second.

```
<cidl:SensoryDeviceCapability xsi:type="dcdv:TactileCapabilityType"
intensityUnit="urn:mpeg:mpeg-v:01-CI-UnitTypeCS-NS:celsius" maxValue="34"
minValue="16"  arraysizeX="10" arraysizeY="4"  gapX="5" gapY="5"
maxUpdateRate="10" actuatorType="urn:mpeg:mpeg-v:01-CI-TactileDisplayCS-
NS:thermal" numOfLevels="8"/>
```

5.14 Kinesthetic capability type

5.14.1 XML representation syntax

```
<!-- ################################################ -->
<!--  Kinesthetic capability type                     -->
<!-- ################################################ -->
<complexType name="KinestheticCapabilityType">
   <complexContent>
      <extension base="cidl:SensoryDeviceCapabilityBaseType">
         <sequence>
            <element name="MaximumForce" type="mpegvct:Float3DVectorType"/>
            <element name="MaximumTorque" type="mpegvct:Float3DVectorType"
               minOccurs="0"/>
            <element name="MaximumStiffness" type="mpegvct:Float3DVectorType"
               minOccurs="0"/>
            <element name="DOF" type="dcdv:DOFType"/>
            <element name="WorkSpace" type="dcdv:WorkSpaceType"/>
         </sequence>
         <attribute name="forceUnit" type="mpegvct:unitType" use="optional"/>
         <attribute name="torqueUnit" type="mpegvct:unitType" use="optional"/>
         <attribute name="stiffnessUnit" type="mpegvct:unitType"
            use="optional"/>
         <attribute name="numOfForceLevels" type="nonNegativeInteger"
            use="optional"/>
         <attribute name="numOfTorqueLevels" type="nonNegativeInteger"
            use="optional"/>
         <attribute name="numOfStiffnessLevels" type="nonNegativeInteger"
            use="optional"/>
```

IECNORM.COM : Click to view the full PDF of ISO/IEC 23005-2:2013

© ISO/IEC 2013 – All rights reserved

```
        </extension>
    </complexContent>
</complexType>

<complexType name="DOFType">
    <sequence>
        <element name="Tx" type="boolean"/>
        <element name="Ty" type="boolean"/>
        <element name="Tz" type="boolean"/>
        <element name="Rx" type="boolean"/>
        <element name="Ry" type="boolean"/>
        <element name="Rz" type="boolean"/>
    </sequence>
</complexType>

<complexType name="WorkSpaceType">
    <sequence>
        <element name="Width" type="float"/>
        <element name="Height" type="float"/>
        <element name="Depth" type="float"/>
        <element name="RotationX" type="float"/>
        <element name="RotationY" type="float"/>
        <element name="RotationZ" type="float"/>
    </sequence>
</complexType>
```

IECNORM.COM : Click to view the full PDF of ISO/IEC 23005-2:2013

5.14.2 Binary representation syntax

KinestheticCapabilityType {	(Number of bits)	(Mnemonic)
MaximumTorqueFlag	1	bslbf
MaximumStiffnessFlag	1	bslbf
forceUnitFlag	1	bslbf
torqueUnitFlag	1	bslbf
stiffnessUnitFlag	1	bslbf
numOfForceLevelsFlag	1	bslbf
numOfTorqueLevelsFlag	1	bslbf
numOfStiffnessLevelsFlag	1	bslbf
SensoryDeviceCapabilityBase		SensoryDeviceCapabilityBaseType
MaximumForce		Float3DVectorType
if(MaximumTorqueFlag){		
MaximumTorque		Float3DVectorType
}		

© ISO/IEC 2013 – All rights reserved

KinestheticCapabilityType {	**(Number of bits)**	**(Mnemonic)**
if(MaximumStiffnessFlag){		
MaximumStiffness		Float3DVectorType
}		
DOF		DOFType
workspace		workspaceType
if(forceUnitFlag) {		
forceUnit	8	bslbf
}		
if(torqueUnitFlag) {		
torqueUnit	8	bslbf
}		
if(stiffnessUnitFlag) {		
stiffnessUnit	8	bslbf
}		
if(numOfForceLevelsFlag) {		
numOfForceLevels	16	uimsbf
}		
if(numOfTorqueLevelsFlag) {		
numOfTorqueLevels	16	uimsbf
}		
if(numOfStiffnessLevelsFlag) {		
numOfStiffnessLevels	16	uimsbf
}		
}		
Float3DVectorType {		
X	32	fsbf
Y	32	fsbf

IECNORM.COM : Click to view the full PDF of ISO/IEC 23005-2:2013

© ISO/IEC 2013 – All rights reserved

KinestheticCapabilityType {	**(Number of bits)**	**(Mnemonic)**
Z	32	fsbf
}		
DOFType {		
Tx	1	bslbf
Ty	1	bslbf
Tz	1	bslbf
Rx	1	bslbf
Ry	1	bslbf
Rz	1	bslbf
}		
workspaceType{		
Width	32	fsbf
Height	32	fsbf
Depth	32	fsbf
RotationX	32	fsbf
RotationY	32	fsbf
RotationZ	32	fsbf
}		

IECNORM.COM : Click to view the full PDF of ISO/IEC 23005-2:2013

5.14.3 Semantics

Semantics of the `KinestheticCapabilityType`:

Name	*Definition*
`KinestheticCapabilityType`	Tool for describing a kinesthetic device capability.
`MaximumTorqueFlag`	This field, which is only present in the binary representation, signals the presence of the activation attribute. A value of ”1” means the attribute shall be used and ”0” means the attribute shall not be used.
`MaximumStiffnessFlag`	This field, which is only present in the binary representation, signals the presence of the activation attribute. A value of ”1” means the attribute shall be used and ”0” means the attribute shall not be used.

© ISO/IEC 2013 – All rights reserved

Name	*Definition*
forceUnitFlag	This field, which is only present in the binary representation, signals the presence of the activation attribute. A value of ”1” means the attribute shall be used and ”0” means the attribute shall not be used.
torqueUnitFlag	This field, which is only present in the binary representation, signals the presence of the activation attribute. A value of ”1” means the attribute shall be used and ”0” means the attribute shall not be used.
stiffnessUnitFlag	This field, which is only present in the binary representation, signals the presence of the activation attribute. A value of ”1” means the attribute shall be used and ”0” means the attribute shall not be used.
numOfForceLevelsFlag	This field, which is only present in the binary representation, signals the presence of the activation attribute. A value of ”1” means the attribute shall be used and ”0” means the attribute shall not be used.
numOfTorqueLevelsFlag	This field, which is only present in the binary representation, signals the presence of the activation attribute. A value of ”1” means the attribute shall be used and ”0” means the attribute shall not be used.
numOfStiffnessLevelsFlag	This field, which is only present in the binary representation, signals the presence of the activation attribute. A value of ”1” means the attribute shall be used and ”0” means the attribute shall not be used.
MaximumForce	Describes the maximum force that the device can provide stably for each axis (N).
MaximumTorque	Describes the maximum torque referring maximum rotational force that the device can generate stably for each axis.(Nmm)
MaximumStiffness	Describes the maximum stiffness (rigidity) that the device can generate stably for each axis.(N/mm)
DOF	Describes the DOF (degree of freedom) of the device.
WorkSpace	Describes the workspace of the device. (e.g. Width x Height x Depth(mm), 3 angles(degree))
forceUnit	Specifies the unit of the description of maximumForce attribute as a reference to a classification scheme term provided by UnitTypeCS defined in A.2.1 of ISO/IEC 23005-6, if any unit other than N(Newton) is used. 1N refers a force that produces an acceleration of 1 m/s^2 for 1 kg mass. The reference to the classification scheme shall be done using the mpeg7:termReferenceType defined in 7.6 of ISO/IEC 15938-5:2003.
torqueUnit	Specifies the unit of the description of maximumTorque attribute as a reference to a classification scheme term provided by UnitTypeCS defined in A.2.1 of ISO/IEC 23005-6, if any unit other than Nmm (Newton-millimeter) is used. The reference to the classification scheme shall be done using the mpeg7:termReferenceType defined in 7.6 of ISO/IEC 15938-5:2003.
stiffnessUnit	Specifies the unit of the description of maximumTorque attribute as a reference to a classification scheme term provided by UnitTypeCS defined in A.2.1 of ISO/IEC 23005-6, if any unit other than N/mm (Newton per millimeter) is used. The reference to the classification scheme shall be done using the mpeg7:termReferenceType defined in 7.6 of ISO/IEC 15938-5:2003.

IECNORM.COM : Click to view the full PDF of ISO/IEC 23005-2:2013

© ISO/IEC 2013 – All rights reserved

Name	*Definition*
numOfForceLevels	Describes the number of intensity levels of force that the kinesthetic device can drive.
numOfTorqueLevels	Describes the number of intensity levels of torque that the kinesthetic device can drive.
numOfStiffnessLevels	Describes the number of intensity levels of stiffness that the kinesthetic device can drive.

Semantics of the DOFType:

Name	*Definition*
DOFType	Defines a degree of freedom that shows a kinesthetic device provides several single (independent) movements.
Tx	A Boolean values whether a kinesthetic device allows x directional independent translation or not.
Ty	A Boolean values whether a kinesthetic device allows y directional independent translation or not.
Tz	A Boolean values whether a kinesthetic device allows z directional independent translation or not.
Rx	A Boolean values whether a kinesthetic device allows x directional independent rotation or not.
Ry	A Boolean values whether a kinesthetic device allows y directional independent rotation or not.
Rz	A Boolean values whether a kinesthetic device allows z directional independent rotation or not.

Semantics of the workspaceType:

Name	*Definition*
WorkSpaceType	Defines ranges where a kinesthetic device can translate and rotate. According to DOF (degree of freedom), three translational values(width, height, and depth) in mm(millimeter) and three rotational values(roll, pitch and yaw) in degree are defined.
Width	Defines a maximum range in the unit of mm (millimeter) that a kinesthetic device can translate in x-axis.
Height	Defines a maximum range in the unit of mm (millimeter) that a kinesthetic device can translate in y-axis.
Depth	Defines a maximum range in the unit of mm (millimeter) that a kinesthetic device can translate in z-axis.

IECNORM.COM : Click to view the full PDF of ISO/IEC 23005-2:2013

© ISO/IEC 2013 – All rights reserved

Name	*Definition*
RotationX	Defines a maximum range that a kinesthetic device can rotate in x-axis, Θ(pitch).
RotationY	Defines a maximum range that a kinesthetic device can rotate in y-axis, Ψ(yaw).
RotationZ	Defines a maximum range that a kinesthetic device can rotate in z-axis, φ(roll).

5.14.4 Examples

The following is an example of the KinestheticCapabilityType to indicate that the specified kinesthetic device can display. This example shows the description of kinesthetic device capabilities. This 3DOF kinesthetic device can support maximum force F(3.3N, 2.1N, 2.7N) and maximum stiffness K(1.45N/mm, 2.5N/mm, 1.07N/mm) and it's workspace is 180mm(width), 130mm(height), and 80mm(depth).

```
<cidl:SensoryDeviceCapability xsi:type="dcdv:KinestheticCapabilityType"
forceUnit="urn:mpeg:mpeg-v:01-CI-UnitTypeCS-NS:Newton"
torqueUnit="urn:mpeg:mpeg-v:01-CI-UnitTypeCS-NS:Nmm"
stiffnessUnit="urn:mpeg:mpeg-v:01-CI-UnitTypeCS-NS:Npmm"
numOfForceLevels="100" numOfTorqueLevels="100" numOfStiffnessLevels="100">
    <dcdv:MaximumForce>
        <mpegvct:X>3.3</mpegvct:X>
        <mpegvct:Y>2.1</mpegvct:Y>
        <mpegvct:Z>2.7</mpegvct:Z>
    </dcdv:MaximumForce>
    <dcdv:MaximumTorque>
        <mpegvct:X>1.0</mpegvct:X>
        <mpegvct:Y>1.0</mpegvct:Y>
        <mpegvct:Z>-1.0</mpegvct:Z>
    </dcdv:MaximumTorque>
    <dcdv:MaximumStiffness>
        <mpegvct:X>1.0</mpegvct:X>
        <mpegvct:Y>1.0</mpegvct:Y>
        <mpegvct:Z>-1.0</mpegvct:Z>
    </dcdv:MaximumStiffness>
    <dcdv:DOF>
        <dcdv:Tx>true</dcdv:Tx>
        <dcdv:Ty>true</dcdv:Ty>
        <dcdv:Tz>true</dcdv:Tz>
        <dcdv:Rx>false</dcdv:Rx>
        <dcdv:Ry>false</dcdv:Ry>
        <dcdv:Rz>false</dcdv:Rz>
    </dcdv:DOF>
    <dcdv:WorkSpace>
        <dcdv:Width>180</dcdv:Width>
        <dcdv:Height>130</dcdv:Height>
        <dcdv:Depth>80</dcdv:Depth>
        <dcdv:RotationX>0</dcdv:RotationX>
        <dcdv:RotationY>0</dcdv:RotationY>
        <dcdv:RotationZ>0</dcdv:RotationZ>
    </dcdv:WorkSpace>
</cidl:SensoryDeviceCapability>
```

IECNORM.COM : Click to view the full PDF of ISO/IEC 23005-2:2013

© ISO/IEC 2013 – All rights reserved

5.15 RigidBodyMotion capability type

5.15.1 XML representation syntax

```
<!-- ################################################ -->
<!--  Rigid Body Motion capability type               -->
<!-- ################################################ -->
<complexType name="RigidBodyMotionCapabilityType">
   <complexContent>
      <extension base="cidl:SensoryDeviceCapabilityBaseType">
         <sequence>
            <element name="MoveTowardCapability"
               type="dcdv:MoveTowardCapabilityType" minOccurs="0"/>
            <element name="InclineCapability" type="dcdv:InclineCapabilityType"
               minOccurs="0"/>
         </sequence>
      </extension>
   </complexContent>
</complexType>

<!-- ################################################ -->
<!--  MoveToward Capability type                      -->
<!-- ################################################ -->
<complexType name="MoveTowardCapabilityType">
   <attribute name="maxXDistance" type="float" use="optional"/>
   <attribute name="maxYDistance" type="float" use="optional"/>
   <attribute name="maxZDistance" type="float" use="optional"/>
   <attribute name="distanceUnit" type="mpegvct:unitType" use="optional"/>
   <attribute name="maxXSpeed" type="float" use="optional"/>
   <attribute name="maxYSpeed" type="float" use="optional"/>
   <attribute name="maxZSpeed" type="float" use="optional"/>
   <attribute name="speedUnit" type="mpegvct:unitType" use="optional"/>
   <attribute name="maxXAccel" type="float" use="optional"/>
   <attribute name="maxYAccel" type="float" use="optional"/>
   <attribute name="maxZAccel" type="float" use="optional"/>
   <attribute name="accelUnit" type="mpegvct:unitType" use="optional"/>
   <attribute name="xDistanceLevels" type="nonNegativeInteger" use="optional"/>
   <attribute name="yDistanceLevels" type="nonNegativeInteger" use="optional"/>
   <attribute name="zDistanceLevels" type="nonNegativeInteger" use="optional"/>
   <attribute name="xSpeedLevels" type="nonNegativeInteger" use="optional"/>
   <attribute name="ySpeedLevels" type="nonNegativeInteger" use="optional"/>
   <attribute name="zSpeedLevels" type="nonNegativeInteger" use="optional"/>
   <attribute name="xAccelLevels" type="nonNegativeInteger" use="optional"/>
   <attribute name="yAccelLevels" type="nonNegativeInteger" use="optional"/>
   <attribute name="zAccelLevels" type="nonNegativeInteger" use="optional"/>
</complexType>

<!-- ################################################ -->
<!--  Incline Capability type                         -->
<!-- ################################################ -->
<complexType name="InclineCapabilityType">
   <attribute name="maxPitchAngle" type="mpegvct:InclineAngleType"
use="optional"/>
   <attribute name="maxYawAngle" type="mpegvct:InclineAngleType"
use="optional"/>
   <attribute name="maxRollAngle" type="mpegvct:InclineAngleType"
use="optional"/>
   <attribute name="maxPitchSpeed" type="float" use="optional"/>
   <attribute name="maxYawSpeed" type="float" use="optional"/>
```

IECNORM.COM : Click to view the full PDF of ISO/IEC 23005-2:2013

© ISO/IEC 2013 – All rights reserved

```
    <attribute name="maxRollSpeed" type="float" use="optional"/>
    <attribute name="speedUnit" type="mpegvct:unitType" use="optional"/>
    <attribute name="maxPitchAccel" type="float" use="optional"/>
    <attribute name="maxYawAccel" type="float" use="optional"/>
    <attribute name="maxRollAccel" type="float" use="optional"/>
    <attribute name="accelUnit" type="mpegvct:unitType" use="optional"/>
    <attribute name="pitchAngleLevels" type="nonNegativeInteger" use="optional"/>
    <attribute name="yawAngleLevels" type="nonNegativeInteger" use="optional"/>
    <attribute name="rollAngleLevels" type="nonNegativeInteger" use="optional"/>
    <attribute name="pitchSpeedLevels" type="nonNegativeInteger" use="optional"/>
    <attribute name="yawSpeedLevels" type="nonNegativeInteger" use="optional"/>
    <attribute name="rollSpeedLevels" type="nonNegativeInteger" use="optional"/>
    <attribute name="pitchAccelLevels" type="nonNegativeInteger" use="optional"/>
    <attribute name="yawAccelLevels" type="nonNegativeInteger" use="optional"/>
    <attribute name="rollAccelLevels" type="nonNegativeInteger" use="optional"/>
</complexType>
```

5.15.2 Binary representation syntax

RigidBodyMotionCapabilityType {	**(Number of bits)**	**(Mnemonic)**
MoveTowardCapabilityFlag	1	bslbf
InclineCapabilityFlag	1	bslbf
SensoryDeviceCapabilityBase		SensoryDeviceCapabilityBaseType
if(MoveTowardCapabilityFlag){		
MoveTowardCapability		MoveTowardCapabilityType
}		
if(InclineCapabilityFlag){		
InclineCapability		InclineCapabilityType
}		
}		
MoveTowardCapabilityType {		
MaxXDistanceFlag	1	bslbf
MaxYDistanceFlag	1	bslbf
MaxZDistanceFlag	1	bslbf
distanceUnitFlag	1	bslbf
MaxXSpeedFlag	1	bslbf
MaxYSpeedFlag	1	bslbf

IECNORM.COM : Click to view the full PDF of ISO/IEC 23005-2:2013

© ISO/IEC 2013 – All rights reserved

RigidBodyMotionCapabilityType {	**(Number of bits)**	**(Mnemonic)**
MaxZSpeedFlag	1	bslbf
speedUnitFlag	1	bslbf
MaxXAccelFlag	1	bslbf
MaxYAccelFlag	1	bslbf
MaxZAccelFlag	1	bslbf
accelUnitFlag	1	bslbf
XDistanceLevelsFlag	1	bslbf
YDistanceLevelsFlag	1	bslbf
ZDistanceLevelsFlag	1	bslbf
XSpeedLevelsFlag	1	bslbf
YSpeedLevelsFlag	1	bslbf
ZSpeedLevelsFlag	1	bslbf
XAccelLevelsFlag	1	bslbf
YAccelLevelsFlag	1	bslbf
ZAccelLevelsFlag	1	bslbf
if(MaxXDistanceFlag){		
MaxXDistance	32	fsbf
}		
if(MaxYDistanceFlag){		
MaxYDistance	32	fsbf
}		
if(MaxZDistanceFlag){		
MaxZDistance	32	fsbf
}		
if(distanceUnitFlag){		
distanceUnit	8	bslbf
}		

IECNORM.COM : Click to view the full PDF of ISO/IEC 23005-2:2013

© ISO/IEC 2013 – All rights reserved

RigidBodyMotionCapabilityType {	**(Number of bits)**	**(Mnemonic)**
if(MaxXSpeedFlag){		
MaxXSpeed	32	fsbf
}		
if(MaxYSpeedFlag){		
MaxYSpeed	32	fsbf
}		
if(MaxZSpeedFlag){		
MaxZSpeed	32	fsbf
}		
if(speedUnitFlag){		
speedUnit	8	bslbf
}		
if(MaxXAccelFlag){		
MaxXAccel	32	fsbf
}		
if(MaxYAccelFlag){		
MaxYAccel	32	fsbf
}		
if(MaxZAccelFlag){		
MaxZAccel	32	fsbf
}		
if(accelUnitFlag){		
accelUnit	8	bslbf
}		
if(XDistanceLevelsFlag){		
XDistanceLevels	16	uimsbf
}		

IECNORM.COM : Click to view the full PDF of ISO/IEC 23005-2:2013

© ISO/IEC 2013 – All rights reserved

RigidBodyMotionCapabilityType {	**(Number of bits)**	**(Mnemonic)**
if(YDistanceLevelsFlag){		
YDistanceLevels	16	uimsbf
}		
if(ZDistanceLevelsFlag){		
ZDistanceLevels	16	uimsbf
}		
if(XSpeedLevelsFlag){		
XSpeedLevels	16	uimsbf
}		
if(YSpeedLevelsFlag){		
YSpeedLevels	16	uimsbf
}		
if(ZSpeedLevelsFlag){		
ZSpeedLevels	16	uimsbf
}		
if(XAccelLevelsFlag){		
XAccelLevels	16	uimsbf
}		
if(YAccelLevelsFlag){		
YAccelLevels	16	uimsbf
}		
if(ZAccelLevelsFlag){		
ZAccelLevels	16	uimsbf
}		
}		
InclineCapabilityType {		
MaxPitchAngleFlag	1	bslbf

IECNORM.COM : Click to view the full PDF of ISO/IEC 23005-2:2013

© ISO/IEC 2013 – All rights reserved

RigidBodyMotionCapabilityType {	**(Number of bits)**	**(Mnemonic)**
MaxYawAngleFlag	1	bslbf
MaxRollAngleFlag	1	bslbf
MaxPitchSpeedFlag	1	bslbf
MaxYawSpeedFlag	1	bslbf
MaxRollSpeedFlag	1	bslbf
speedUnitFlag	1	bslbf
MaxPitchAccelFlag	1	bslbf
MaxYawAccelFlag	1	bslbf
MaxRollAccelFlag	1	bslbf
accelUnitFlag	1	bslbf
PitchAngleLevelsFlag	1	bslbf
YawAngleLevelsFlag	1	bslbf
RollAngleLevelsFlag	1	bslbf
PitchSpeedLevelsFlag	1	bslbf
YawSpeedLevelsFlag	1	bslbf
RollSpeedLevelsFlag	1	bslbf
PitchAccelLevelsFlag	1	bslbf
YawAccelLevelsFlag	1	bslbf
RollAccelLevelsFlag	1	bslbf
if(MaxPitchAngleFlag){		
MaxPitchAngle		InclineAngleType
}		
if(MaxYawAngleFlag){		
MaxYawAngle		InclineAngleType
}		
if(MaxRollAngleFlag){		
MaxRollAngle		InclineAngleType

IECNORM.COM : Click to view the full PDF of ISO/IEC 23005-2:2013

© ISO/IEC 2013 – All rights reserved

RigidBodyMotionCapabilityType {	**(Number of bits)**	**(Mnemonic)**
}		
if(MaxPitchSpeedFlag){		
MaxPitchSpeed	32	fsbf
}		
if(MaxYawSpeedFlag){		
MaxYawSpeed	32	fsbf
}		
if(MaxRollSpeedFlag){		
MaxRollSpeed	32	fsbf
}		
if(speedUnitFlag){		
speedUnit	8	bslbf
}		
if(MaxPitchAccelFlag){		
MaxPitchAccel	32	fsbf
}		
if(MaxYawAccelFlag){		
MaxYawAccel	32	fsbf
}		
if(MaxRollAccelFlag){		
MaxRollAccel	32	fsbf
}		
if(accelUnitFlag){		
accelUnit	8	bslbf
}		
if(PitchAngleLevelsFlag){		
PitchAngleLevels	16	uimsbf

IECNORM.COM : Click to view the full PDF of ISO/IEC 23005-2:2013

© ISO/IEC 2013 – All rights reserved

RigidBodyMotionCapabilityType {	**(Number of bits)**	**(Mnemonic)**
}		
if(YawAngleLevelsFlag){		
YawAngleLevels	16	uimsbf
}		
if(RollAngleLevelsFlag){		
RollAngleLevels	16	uimsbf
}		
if(PitchSpeedLevelsFlag){		
PitchSpeedLevels	16	uimsbf
}		
if(YawSpeedLevelsFlag){		
YawSpeedLevels	16	uimsbf
}		
if(RollSpeedLevelsFlag){		
RollSpeedLevels	16	uimsbf
}		
if(PitchAccelLevelsFlag){		
PitchAccelLevels	16	uimsbf
}		
if(YawAccelLevelsFlag){		
YawAccelLevels	16	uimsbf
}		
if(RollAccelLevelsFlag){		
RollAccelLevels	16	uimsbf
}		
}		

IECNORM.COM : Click to view the full PDF of ISO/IEC 23005-2:2013

© ISO/IEC 2013 – All rights reserved

5.15.3 Semantics

Semantics of the `RigidBodyMotionCapabilityType` type:

Name	*Definition*
`RigidBodyMotionCapabilityType`	Tool for describing the capability of Rigid body motion effect.
`MoveTowardCapabilityFlag`	This field, which is only present in the binary representation, signals the presence of the activation attribute. A value of "1" means the attribute shall be used and "0" means the attribute shall not be used.
`InclineCapabilityFlag`	This field, which is only present in the binary representation, signals the presence of the activation attribute. A value of "1" means the attribute shall be used and "0" means the attribute shall not be used.
`MoveTowardCapability`	Describes the capability for move toward motion effect.
`InclineCapability`	Describes the capability for Incline motion effect.

Semantics of the `MoveTowardCapabilityType` type:

Name	*Definition*
`MoveTowardCapability Type`	Tool for describing a capability on move toward motion effect.
`MaxXDistanceFlag`	This field, which is only present in the binary representation, signals the presence of the activation attribute. A value of "1" means the attribute shall be used and "0" means the attribute shall not be used.
`MaxYDistanceFlag`	This field, which is only present in the binary representation, signals the presence of the activation attribute. A value of "1" means the attribute shall be used and "0" means the attribute shall not be used.
`MaxZDistanceFlag`	This field, which is only present in the binary representation, signals the presence of the activation attribute. A value of "1" means the attribute shall be used and "0" means the attribute shall not be used.
`distanceUnitFlag`	This field, which is only present in the binary representation, signals the presence of the activation attribute. A value of "1" means the attribute shall be used and "0" means the attribute shall not be used.
`MaxXSpeedFlag`	This field, which is only present in the binary representation, signals the presence of the activation attribute. A value of "1" means the attribute shall be used and "0" means the attribute shall not be used.
`MaxYSpeedFlag`	This field, which is only present in the binary representation, signals the presence of the activation attribute. A value of "1" means the attribute shall be used and "0" means the attribute shall not be used.
`MaxZSpeedFlag`	This field, which is only present in the binary representation, signals the presence of the activation attribute. A value of "1" means the attribute shall be used and "0" means the attribute shall not be used.

IECNORM.COM : Click to view the full PDF of ISO/IEC 23005-2:2013

© ISO/IEC 2013 – All rights reserved

Name	*Definition*
speedUnitFlag	This field, which is only present in the binary representation, signals the presence of the activation attribute. A value of ”1” means the attribute shall be used and ”0” means the attribute shall not be used.
MaxXAccelFlag	This field, which is only present in the binary representation, signals the presence of the activation attribute. A value of ”1” means the attribute shall be used and ”0” means the attribute shall not be used.
MaxYAccelFlag	This field, which is only present in the binary representation, signals the presence of the activation attribute. A value of ”1” means the attribute shall be used and ”0” means the attribute shall not be used.
MaxZAccelFlag	This field, which is only present in the binary representation, signals the presence of the activation attribute. A value of ”1” means the attribute shall be used and ”0” means the attribute shall not be used.
accelUnitFlag	This field, which is only present in the binary representation, signals the presence of the activation attribute. A value of ”1” means the attribute shall be used and ”0” means the attribute shall not be used.
XDistanceLevelsFlag	This field, which is only present in the binary representation, signals the presence of the activation attribute. A value of ”1” means the attribute shall be used and ”0” means the attribute shall not be used.
YDistanceLevelsFlag	This field, which is only present in the binary representation, signals the presence of the activation attribute. A value of ”1” means the attribute shall be used and ”0” means the attribute shall not be used.
ZDistanceLevelsFlag	This field, which is only present in the binary representation, signals the presence of the activation attribute. A value of ”1” means the attribute shall be used and ”0” means the attribute shall not be used.
XSpeedLevelsFlag	This field, which is only present in the binary representation, signals the presence of the activation attribute. A value of ”1” means the attribute shall be used and ”0” means the attribute shall not be used.
YSpeedLevelsFlag	This field, which is only present in the binary representation, signals the presence of the activation attribute. A value of ”1” means the attribute shall be used and ”0” means the attribute shall not be used.
ZSpeedLevelsFlag	This field, which is only present in the binary representation, signals the presence of the activation attribute. A value of ”1” means the attribute shall be used and ”0” means the attribute shall not be used.
XAccelLevelsFlag	This field, which is only present in the binary representation, signals the presence of the activation attribute. A value of ”1” means the attribute shall be used and ”0” means the attribute shall not be used.
YAccelLevelsFlag	This field, which is only present in the binary representation, signals the presence of the activation attribute. A value of ”1” means the attribute shall be used and ”0” means the attribute shall not be used.
ZAccelLevelsFlag	This field, which is only present in the binary representation, signals the presence of the activation attribute. A value of ”1” means the attribute shall be used and ”0” means the attribute shall not be used.

IECNORM.COM : Click to view the full PDF of ISO/IEC 23005-2:2013

© ISO/IEC 2013 – All rights reserved

Name	*Definition*
maxXDistance	Describes the maximum distance on x-axis that the device can provide in terms of centimeter. EXAMPLE The value '10' means the device can move maximum 10cm on x-axis. NOTE The value 0 means the device can't provide x-axis movement.
maxYDistance	Describes the maximum distance on y-axis that the device can provide in terms of centimeter.
maxZDistance	Describes the maximum distance on z-axis that the device can provide in terms of centimeter.
distanceUnit	Specifies the unit of the description of MaxXDistance, MaxYDistance, and MaxZDistance attributes as a reference to a classification scheme term provided by UnitTypeCS defined in A.2.1 of ISO/IEC 23005-6, if any unit other than cm (centimeter) is used. These three attributes shall have the same unit. The reference to the classification scheme shall be done using the mpeg7:termReferenceType defined in 7.6 of ISO/IEC 15938-5:2003.
maxXSpeed	Describes the maximum speed on x-axis that the device can provide in terms of centimeter per second.
maxYSpeed	Describes the maximum speed on y-axis that the device can provide in terms of centimeter per second.
maxZSpeed	Describes the maximum speed on z-axis that the device can provide in terms of centimeter per second.
speedUnit	Specifies the unit of the description of MaxXSpeed, MaxYSpeed, and MaxZSpeed attributes as a reference to a classification scheme term provided by UnitTypeCS defined in A.2.1 of ISO/IEC 23005-6, if any unit other than cm/sec (centimeter per second) is used. These three attributes shall have the same unit. The reference to the classification scheme shall be done using the mpeg7:termReferenceType defined in 7.6 of ISO/IEC 15938-5:2003.
maxXAccel	Describes the maximum acceleration on x-axis that the device can provide in terms of centimeter per square second.
maxYAccel	Describes the maximum acceleration on y-axis that the device can provide in terms of centimeter per square second.
maxZAccel	Describes the maximum acceleration on z-axis that the device can provide in terms of centimeter per second square.
accelUnit	Specifies the unit of the description of MaxXAccel, MaxYAccel, and MaxZAccel attributes as a reference to a classification scheme term provided by UnitTypeCS defined in A.2.1 of ISO/IEC 23005-6, if any unit other than cm/sec^2 (centimeter per second square) is used. These three attributes shall have the same unit. The reference to the classification scheme shall be done using the mpeg7:termReferenceType defined in 7.6 of ISO/IEC 15938-5:2003.

IECNORM.COM : Click to view the full PDF of ISO/IEC 23005-2:2013

© ISO/IEC 2013 – All rights reserved

Name	*Definition*
xDistancelevels	Describes the number of distance levels that the device can provide in between maximum and minimum distance on x-axis. EXAMPLE The value 5 means the device can provide 5 steps from minimum to maximum distance in x-axis.
yDistancelevels	Describes the number of distance levels that the device can provide in between maximum and minimum distance on y-axis.
zDistancelevels	Describes the number of distance levels that the device can provide in between maximum and minimum distance on z-axis.
xSpeedLevels	Describes the number of speed levels that the device can provide in between maximum and minimum speed on x-axis.
ySpeedLevels	Describes the number of speed levels that the device can provide in between maximum and minimum speed on y-axis.
zSpeedLevels	Describes the number of speed levels that the device can provide in between maximum and minimum speed on z-axis.
xAccelLevels	Describes the number of acceleration that the device can provide in between maximum and minimum acceleration on x-axis.
yAccelLevels	Describes the number of acceleration that the device can provide in between maximum and minimum acceleration on y-axis.
zAccelLevels	Describes the number of acceleration that the device can provide in between maximum and minimum acceleration on z-axis.

Semantics of the `InclineCapabilityType`:

Name	*Definition*
InclineCapabilityType	Tool for describing a capability on motion chair incline effect.
MaxPitchAngleFlag	This field, which is only present in the binary representation, signals the presence of the activation attribute. A value of ”1” means the attribute shall be used and ”0” means the attribute shall not be used.
MaxYawAngleFlag	This field, which is only present in the binary representation, signals the presence of the activation attribute. A value of ”1” means the attribute shall be used and ”0” means the attribute shall not be used.
MaxRollAngleFlag	This field, which is only present in the binary representation, signals the presence of the activation attribute. A value of ”1” means the attribute shall be used and ”0” means the attribute shall not be used.
MaxPitchSpeedFlag	This field, which is only present in the binary representation, signals the presence of the activation attribute. A value of ”1” means the attribute shall be used and ”0” means the attribute shall not be used.

IECNORM.COM : Click to view the full PDF of ISO/IEC 23005-2:2013

© ISO/IEC 2013 – All rights reserved

Name	*Definition*
MaxYawSpeedFlag	This field, which is only present in the binary representation, signals the presence of the activation attribute. A value of ”1” means the attribute shall be used and ”0” means the attribute shall not be used.
MaxRollSpeedFlag	This field, which is only present in the binary representation, signals the presence of the activation attribute. A value of ”1” means the attribute shall be used and ”0” means the attribute shall not be used.
speedUnitFlag	This field, which is only present in the binary representation, signals the presence of the activation attribute. A value of ”1” means the attribute shall be used and ”0” means the attribute shall not be used.
MaxPitchAccelFlag	This field, which is only present in the binary representation, signals the presence of the activation attribute. A value of ”1” means the attribute shall be used and ”0” means the attribute shall not be used.
MaxYawAccelFlag	This field, which is only present in the binary representation, signals the presence of the activation attribute. A value of ”1” means the attribute shall be used and ”0” means the attribute shall not be used.
MaxRollAccelFlag	This field, which is only present in the binary representation, signals the presence of the activation attribute. A value of ”1” means the attribute shall be used and ”0” means the attribute shall not be used.
accelUnitFlag	This field, which is only present in the binary representation, signals the presence of the activation attribute. A value of ”1” means the attribute shall be used and ”0” means the attribute shall not be used.
PitchAngleLevelsFlag	This field, which is only present in the binary representation, signals the presence of the activation attribute. A value of ”1” means the attribute shall be used and ”0” means the attribute shall not be used.
YawAngleLevelsFlag	This field, which is only present in the binary representation, signals the presence of the activation attribute. A value of ”1” means the attribute shall be used and ”0” means the attribute shall not be used.
RollAngleLevelsFlag	This field, which is only present in the binary representation, signals the presence of the activation attribute. A value of ”1” means the attribute shall be used and ”0” means the attribute shall not be used.
PitchSpeedLevelsFlag	This field, which is only present in the binary representation, signals the presence of the activation attribute. A value of ”1” means the attribute shall be used and ”0” means the attribute shall not be used.
YawSpeedLevelsFlag	This field, which is only present in the binary representation, signals the presence of the activation attribute. A value of ”1” means the attribute shall be used and ”0” means the attribute shall not be used.
RollSpeedLevelsFlag	This field, which is only present in the binary representation, signals the presence of the activation attribute. A value of ” 1” means the attribute shall be used and ” 0” means the attribute shall not be used.
PitchAccelLevelsFlag	This field, which is only present in the binary representation, signals the presence of the activation attribute. A value of ”1” means the attribute shall be used and ”0” means the attribute shall not be used.

IECNORM.COM : Click to view the full PDF of ISO/IEC 23005-2:2013

© ISO/IEC 2013 – All rights reserved

Name	*Definition*
YawAccelLevelsFlag	This field, which is only present in the binary representation, signals the presence of the activation attribute. A value of ”1” means the attribute shall be used and ”0” means the attribute shall not be used.
RollAccelLevelsFlag	This field, which is only present in the binary representation, signals the presence of the activation attribute. A value of ”1” means the attribute shall be used and ”0” means the attribute shall not be used.
maxPitchAngle	Describes the maximum angle of x-axis rotation in degrees that the device can provide. NOTE The rotation angle is increased with counter-clock wise.
maxYawAngle	Describes the maximum angle of y-axis rotation in degrees that the device can provide. NOTE The rotation angle is increased with counter-clock wise.
maxRollAngle	Describes the maximum angle of z-axis rotation in degrees that the device can provide. NOTE The rotation angle is increased with counter-clock wise.
maxPitchSpeed	Describes the maximum speed of x-axis rotation that the device can provide in terms of degree per second.
maxYawSpeed	Describes the maximum speed of y-axis rotation that the device can provide in terms of degree per second.
maxRollSpeed	Describes the maximum speed of z-axis rotation that the device can provide in terms of degree per second.
speedUnit	Specifies the common unit of the description of maxPitchSpeed, maxYawSpeed, and maxRollSpeed attributes as a reference to a classification scheme term provided by UnitTypeCS defined in A.2.1 of ISO/IEC 23005-6, if any unit other than degree per sencod is used. The reference to the classification scheme shall be done using the mpeg7:termReferenceType defined in 7.6 of ISO/IEC 15938-5:2003.
maxPitchAccel	Describes the maximum acceleration of x-axis rotation that the device can provide in terms of degree per second square.
maxYawAccel	Describes the maximum acceleration of y-axis rotation that the device can provide in terms of degree per second square.
maxRollAccel	Describes the maximum acceleration of z-axis rotation that the device can provide in terms of degree per second square.
accelUnit	Specifies the common unit of the description of maxPitchAccel, maxYawAccel, and maxRollAccel attributes as a reference to a classification scheme term provided by UnitTypeCS defined in A.2.1 of ISO/IEC 23005-6, if any unit other than degree per sencod square is used. The reference to the classification scheme shall be done using the mpeg7:termReferenceType defined in 7.6 of ISO/IEC 15938-5:2003.

IECNORM.COM : Click to view the full PDF of ISO/IEC 23005-2:2013

© ISO/IEC 2013 – All rights reserved

Name	*Definition*
pitchAngleLevels	Describes the number of rotation angle levels that the device can provide in between maximum and minimum angle of x-axis rotation. EXAMPLE The value 5 means the device can provide 5 steps from minimum to maximum rotation angle on x-axis.
yawAngleLevels	Describes the number of rotation angle levels that the device can provide in between maximum and minimum angle of y-axis rotation.
rollAngleLevels	Describes the number of rotation angle levels that the device can provide in between maximum and minimum angle of z-axis rotation.
pitchSpeedLevels	Describes the number of rotation speed levels that the device can provide in between maximum and minimum speed of x-axis rotation. EXAMPLE The value 5 means the device can provide 5 steps from minimum to maximum rotation angle on x-axis.
yawSpeedLevels	Describes the number of rotation speed levels that the device can provide in between maximum and minimum speed of y-axis rotation.
rollSpeedLevels	Describes the number of rotation speed levels that the device can provide in between maximum and minimum speed of z-axis rotation.
pitchAccelLevles	Describes the number of rotation acceleration levels that the device can provide in between maximum and minimum acceleration of x-axis rotation.
yawAccelLevles	Describes the number of rotation acceleration levels that the device can provide in between maximum and minimum acceleration of y-axis rotation.
rollAccelLevles	Describes the number of rotation acceleration levels that the device can provide in between maximum and minimum acceleration of z-axis rotation.

IECNORM.COM : Click to view the full PDF of ISO/IEC 23005-2:2013

5.15.4 Examples

This example shows the description of a MoveToward capability. This device can move maximum 20cm on x and y-axis. The maximum speed of example device on x-axis, y-axis is 10cm/sec and z-axis is 0. Also the maximum acceleration on x-axis, y-axis is 1cm/sec^2 and z-axis is 0. That is, example device can not move on z-axis. x speed level and acceleration level is ‘10’ and ‘5’, y speed level and acceleration level is ‘5’ respectively.

```
<dcdv:MoveTowardCapability maxXAccel="1" maxXSpeed="10" maxXDistance="20"
maxYAccel="1" maxYSpeed="10" maxYDistance="20" maxZAccel="0" maxZSpeed="0"
maxZDistance="0" xAccelLevels="5" xDistanceLevels="20" xSpeedLevels="10"
yAccelLevels="5" yDistanceLevels="20" ySpeedLevels="20" zAccelLevels="0"
zDistanceLevels="0" zSpeedLevels="0"/>
```

This example shows the description of an Incline capability. This device can rotate 180 and 90 degree on x and y-axis. The maximum speed of example device on x-axis, y-axis is 10degree/sec and z-axis is 0. Also the maximum acceleration on x-axis, y-axis is 2degree/sec^2 and z-axis is 0. That is, example device can not move on z-axis. x speed level and acceleration level is ‘1’, y speed level and acceleration level is ‘1’ respectively.

© ISO/IEC 2013 – All rights reserved

```
<dcdv:InclineCapability maxPitchAccel="2" maxPitchAngle="180" maxPitchSpeed="10"
maxYawAccel="2"      maxYawAngle="90"      maxYawSpeed="10"      maxRollAccel="0"
maxRollAngle="0"   maxRollSpeed="0"   pitchAccelLevels="1"   pitchAngleLevels="1"
pitchSpeedLevels="1"   yawAccelLevels="1"   yawAngleLevels="1"   yawSpeedLevels="1"
rollAccelLevels="0" rollAngleLevels="0" rollSpeedLevels="0"/>
```

5.16 Mobile device position capability type

5.16.1 XML representation syntax

```
<!-- ################################################ -->
<!-- Mobile Device Position CapabilityType type       -->
<!-- ################################################ -->
<complexType name="MobileDevicePositionCapabilityType">
   <complexContent>
      <extension base="cidl:SensoryDeviceCapabilityBaseType">
         <sequence>
            <element name="Boundary" type="dcdv:PhysicalSpaceBoundingBoxType"/>
         </sequence>
<!-- Precision -->
         <attribute name="numOfLongitudeLevels" type="nonNegativeInteger"
use="optional"/>
         <attribute name="numOfLatitudeLevels" type="nonNegativeInteger"
use="optional"/>
         <attribute name="numOfAltitudeLevels" type="nonNegativeInteger"
use="optional"/>
      </extension>
   </complexContent>
</complexType>

<complexType name="PhysicalSpaceBoundingBoxType">
   <sequence>
      <element name="Longitude">
         <complexType>
            <attribute name="lowerBound" use="optional" default="-180.0">
               <simpleType>
                  <restriction base="double">
                     <minInclusive value="-180.0"/>
                     <maxInclusive value="180.0"/>
                  </restriction>
               </simpleType>
            </attribute>
            <attribute name="upperBound" use="optional" default="180.0">
               <simpleType>
                  <restriction base="double">
                     <minInclusive value="-180.0"/>
                     <maxInclusive value="180.0"/>
                  </restriction>
               </simpleType>
            </attribute>
         </complexType>
      </element>
      <element name="Latitude">
         <complexType>
            <attribute name="lowerBound" use="optional" default="-90.0">
               <simpleType>
```

IECNORM.COM : Click to view the full PDF of ISO/IEC 23005-2:2013

© ISO/IEC 2013 – All rights reserved

```
                    <restriction base="double">
                        <minInclusive value="-90.0"/>
                        <maxInclusive value="90.0"/>
                    </restriction>
                </simpleType>
            </attribute>
            <attribute name="upperBound" use="optional" default="90.0">
                <simpleType>
                    <restriction base="double">
                        <minInclusive value="-90.0"/>
                        <maxInclusive value="90.0"/>
                    </restriction>
                </simpleType>
            </attribute>
        </complexType>
    </element>
    <element name="Altitude">
        <complexType>
            <attribute name="lowerBound" type="double" use="optional"
default="0.0"/>
            <attribute name="upperBound" type="double" use="optional"/>
            <attribute name="unit" type="mpegvct:unitType" use="optional"/>
        </complexType>
    </element>
  </sequence>
</complexType>
```

5.16.2 Binary representation syntax

MobileDevicePositionCapabilityType {	(Number of bits)	(Mnemonic)
Boundary		PhysicalSpaceBoundingBoxType
SensoryDeviceCapabilityBase		SensoryDeviceCapabilityBaseType
}		
PhysicalSpaceBoundingBoxType {		
longitudeUpperBoundFlag	1	bsblf
longitudeLowerBoundFlag	1	bsblf
latitudeUpperBoundFlag	1	bsblf
latitudeLowerBoundFlag	1	bsblf
altitudeUpperBoundFlag	1	bsblf
altitudeLowerBoundFlag	1	bsblf
altitudeUnitFlag	1	bsblf
If(longitudeUpperBoundFlag) {		
longitudeUpperBound	32	fsfb

IECNORM.COM : Click to view the full PDF of ISO/IEC 23005-2:2013

© ISO/IEC 2013 – All rights reserved

MobileDevicePositionCapabilityType {	**(Number of bits)**	**(Mnemonic)**
}		
If(longitudeLowerBoundFlag) {		
longitudeLowerBound	32	fsfb
}		
If(latitudeUpperBoundFlag) {		
latitudeUpperBound	32	fsfb
}		
If(latitudeLowerBoundFlag) {		
latitudeLowerBound	32	fsfb
}		
If(altitudeUpperBoundFlag) {		
altitudeUpperBound	32	fsfb
}		
If(altitudeLowerBoundFlag) {		
altitudeLowerBound	32	fsfb
}		
If(altitudeUnitFlag) {		
altitudeUnit	10	bslbf
}		
}		

IECNORM.COM : Click to view the full PDF of ISO/IEC 23005-2:2013

5.16.3 Semantics

Semantics of the `MobileDevicePositionCapabilityType`:

Names	*Description*
`MobileDevicePositionCapabilityType`	Tool for describing capabilities of a mobile device which can move to a destination given as a position in the global positioning system, i.e. in Longitude, Latitude, and Altitude above sea level.
`zerothOrderDelayTime`	Describes required preparation time of the mobile device to be activated since it receives a command in the unit of millisecond (ms).

© ISO/IEC 2013 – All rights reserved

Names	*Description*
firstOrderDelayTime	Describes the delay time for a mobile device to reach the crusing speed since it receives a command and is activated in the unit of millisecond (ms).
location	Does not have any specific semantics in this description.
Boundary	Describes the destination position where the mobile device can reach in forms of three-dimensional bounding box, specified by using PhysicalSpaceBoundingBoxType.
numOfLongitudeLevels	Describes the number of longitude levels that the device can provide in between upper bound and lower bound longitude positions.
numOfLatitudeLevels	Describes the number of latitude levels that the device can provide in between upper bound and lower bound latitude positions.
numOfAltitudeLevels	Describes the number of altitude levels that the device can provide in between upper bound and lower bound altitude positions.
unit	Does not have any specific semantics in this description.
longitudeUpperBoundFlag	This field, which is only present in the binary representation, indicates if the optional attribute of upperBound of Longitude element is present in this instance of the description.
longitudeLowerBoundFlag	This field, which is only present in the binary representation, indicates if the optional attribute of lowerBound of Longitude element is present in this instance of the description.
latitudeUpperBoundFlag	This field, which is only present in the binary representation, indicates if the optional attribute of upperBound of Latitude element is present in this instance of the description.
latitudeLowerBoundFlag	This field, which is only present in the binary representation, indicates if the optional attribute of lowerBound of Latitude element is present in this instance of the description.
altitudeUpperBoundFlag	This field, which is only present in the binary representation, indicates if the optional attribute of upperBound of Altitude element is present in this instance of the description.
altitudeLowerBoundFlag	This field, which is only present in the binary representation, indicates if the optional attribute of lowerBound of Altitude element is present in this instance of the description.
altitudeUnitFlag	This field, which is only present in the binary representation, indicates if the optional attribute of unit of Altitude element is present in this instance of the description.
PhysicalSpaceBoundingBoxType	Describes a bounding box in a physical space using longitude, latitude, and altitude.
Longitude	Describes lower bound and upper bound of longitude for the bounding box that the mobile device can reach.

IECNORM.COM : Click to view the full PDF of ISO/IEC 23005-2:2013

© ISO/IEC 2013 – All rights reserved

Names	*Description*
`lowerBound`	Lower bound of longitude given in degrees. Positive number represents eastern longitude and the negative number represents western longitude.
`upperBound`	Upper bound of longitude given in degrees. Positive number represents eastern longitude and the negative number represents western longitude.
`Latitude`	Describes lower bound and upper bound of latitude for the bounding box that the mobile device can reach.
`lowerBound`	Lower bound of latitude given in degrees. Positive number represents nothern latitude and the negative number represents southern latitude.
`upperBound`	Upper bound of latitude given in degrees. Positive number represents nothern latitude and the negative number represents southern latitude.
`Altitude`	Describes lower bound and upper bound of altitude for the bounding box that the mobile device can reach.
`lowerBound`	Lower bound of altitude above sea level given in meters. The default is zero.
`upperBound`	Upper bound of altitude above sea level given in meters.
`unit`	Specifies the unit of the lowerBound and upperBound of Altitude, if a unit other than the meter is used, as a reference to a classification scheme term provided by UnitTypeCS defined in A.2.1 of ISO/IEC 23005-6.

5.16.4 Examples

The following example shows the capability description of a mobile device with id "`mobile1`", which can move from 127 degrees East to 132 degrees East in longitude, from 32 degrees North to 45 degrees North in latitude, and from 10 meters to 1200 meters above sea level.

```
<cidl:SensoryDeviceCapability  xsi:type="dcdv:MobileDevicePositionCapabilityType"
id="mobile1">
   <dcdv:Boundary>
      <dcdv:Longitude upperBound="132" lowerBound="127"/>
      <dcdv:Latitude upperBound="45" lowerBound="32"/>
      <dcdv:Altitude upperBound="1200" lowerBound="10" unit="urn:mpeg:mpeg-v:01-
CI-UnitTypeCS-NS:meter"/>
   </dcdv:Boundary>
</cidl:SensoryDeviceCapability>
```

IECNORM.COM : Click to view the full PDF of ISO/IEC 23005-2:2013

© ISO/IEC 2013 – All rights reserved

6 Sensor capability description vocabulary

6.1 Introduction

This Clause describes syntax and semantics of the sensor capability description vocabulary to implement description of capability of individual sensor devices.

6.2 Schema wrapper conventions

The Syntax defined in this Clause assumes the following Schema Wrapper to form a valid XML schema document.

```
<schema xmlns="http://www.w3.org/2001/XMLSchema"
xmlns:mpeg7="urn:mpeg:mpeg7:schema:2004" xmlns:dia="urn:mpeg:mpeg21:2003:01-DIA-
NS" xmlns:mpegvct="urn:mpeg:mpeg-v:2012:01-CT-NS" xmlns:cidl="urn:mpeg:mpeg-
v:2012:01-CIDL-NS" xmlns:scdv="urn:mpeg:mpeg-v:2012:01-SCDV-NS"
targetNamespace="urn:mpeg:mpeg-v:2012:01-SCDV-NS" elementFormDefault="qualified"
attributeFormDefault="unqualified" version="ISO/IEC 23005-2" id="MPEG-V-
SCDV.xsd">
    <import namespace="urn:mpeg:mpeg7:schema:2004"
schemaLocation="http://standards.iso.org/ittf/PubliclyAvailableStandards/MPEG-
7_schema_files/mpeg7-v2.xsd"/>
    <import namespace="urn:mpeg:mpeg21:2003:01-DIA-NS"
schemaLocation="http://standards.iso.org/ittf/PubliclyAvailableStandards/MPEG-
21_schema_files/dia-2nd/UED-2nd.xsd"/>
    <import namespace="urn:mpeg:mpeg-v:2012:01-CIDL-NS"
schemaLocation="CIDL.xsd"/>
    <import namespace="urn:mpeg:mpeg-v:2012:01-CT-NS" schemaLocation="MPEG-V-
CT.xsd"/>
```

Additionally, the following line should be appended to the resulting schema document in order to obtain a well-formed XML document.

```
</schema>
```

IECNORM.COM : Click to view the full PDF of ISO/IEC 23005-2:2013

6.3 Light sensor capability type

6.3.1 XML representation syntax

```
<!-- ################################################ -->
<!-- Light Sensor capability type                     -->
<!-- ################################################ -->
<complexType name="LightSensorCapabilityType">
    <complexContent>
        <extension base="cidl:SensorCapabilityBaseType">
            <sequence>
                <element name="Color" type="mpegvct:colorType" minOccurs="0"
                    maxOccurs="unbounded"/>
                <element name="Location" type="mpegvct:Float3DVectorType"
                    minOccurs="0"/>
            </sequence>
        </extension>
    </complexContent>
</complexType>
```

© ISO/IEC 2013 – All rights reserved

6.3.2 Binary representation syntax

LightSensorCapabilityType {	(Number of bits)	(Mnemonic)
colorFlag	1	bslbf
locationFlag	1	bslbf
SensorCapabilityBase		SensorCapabilityBaseType
if(colorFlag){		
Loopcolor		vluimsbf5
for(k=0;k<Loopcolor;k++){		
color[k]		ColorType
}		
}		
if(locationFlag){		
location		Float3DVectorType
}		
}		
Float3DVectorType {		
X	32	fsbf
Y	32	fsbf
Z	32	fsbf
}		

IECNORM.COM : Click to view the full PDF of ISO/IEC 23005-2:2013

6.3.3 Semantics

Semantics of the `LightSensorCapabilityType` type:

Name	*Definition*
`LightSensorCapabilityType`	Tool for describing a light sensor capability.
`colorFlag`	This field, which is only present in the binary representation, signals the presence of the activation attribute. A value of ”1” means the attribute shall be used and ”0” means the attribute shall not be used.
`locationFlag`	This field, which is only present in the binary representation, signals the presence of the activation attribute. A value of ”1” means the attribute shall be used and ”0” means the attribute shall not be used.

© ISO/IEC 2013 – All rights reserved

Name	*Definition*
maxValue	Describes the maximum value that the light sensor can perceive in terms of LUX.
minValue	Describes the minimum value that the light sensor can perceive in terms of LUX.
Color	Describes the list of colors which the lighting device can provide either as a reference to a classification scheme term or as RGB value. The reference to the classification scheme shall be done using the mpeg7:termReferenceType defined in 7.6 of ISO/IEC 15938-5:2003. A CS that may be used for this purpose is the ColorCS defined in A.2.2 of ISO/IEC 23005-6. EXAMPLE urn:mpeg:mpeg-v:01-SI-ColorCS-NS:alice_blue would describe the color Alice blue.
Location	Describes the location of the device from the global coordinate system according to the x-, y-, and z-axis in the unit of meter (m).

6.3.4 Examples

This example shows the description of a light sensing capability with the following semantics. The sensor has an ID of "LS001" and the maximum value shall be 400 (LUX) and the minimum value shall be 0 (LUX) with the resolution of 50 levels. The accuracy of the sensor is 10.0 (LUX), The offset of sensor is 1.5 (LUX). The sensor shall detect the color #FF000. The sensed information is received at the location of (1.00, 1.00, -1.00).

```
<cidl:SensorDeviceCapability xsi:type="scdv:LightSensorCapabilityType" id="LS001"
maxValue="400" minValue="0" numOfLevels="50" offset="1.5">
   <cidl:Accuracy xsi:type="cidl:ValueAccuracy" value="10.0"/>
      <scdv:Color>#FF000</scdv:Color>
      <scdv:Location>
         <mpegvct:X>1.0</mpegvct:X>
         <mpegvct:Y>1.0</mpegvct:Y>
         <mpegvct:Z>-1.0</mpegvct:Z>
      </scdv:Location>
</cidl:SensorDeviceCapability>
```

6.4 Ambient noise sensor capability type

6.4.1 XML representation syntax

```
<!-- ################################################ -->
<!-- Ambient Noise Sensor capability type             -->
<!-- ################################################ -->
<complexType name="AmbientNoiseSensorCapabilityType">
   <complexContent>
      <extension base="cidl:SensorCapabilityBaseType">
         <sequence>
            <element name="Location" type="mpegvct:Float3DVectorType"
               minOccurs="0"/>
         </sequence>
      </extension>
```

IECNORM.COM : Click to view the full PDF of ISO/IEC 23005-2:2013

© ISO/IEC 2013 – All rights reserved

```
    </complexContent>
</complexType>
```

6.4.2 Binary representation syntax

AmbientNoiseSensorCapabilityType {	**(Number of bits)**	**(Mnemonic)**
LocationFlag	1	bslbf
SensorCapabilityBase		SensorCapabilityBaseType
if(LocationFlag){		
Location		Float3DVectorType
}		
}		

6.4.3 Semantics

Semantics of the `AmbientNoiseSensorCapabilityType` type:

Name	*Definition*
`AmbientNoiseSensor CapabilityType`	Tool for describing an ambient noise sensor capability.
`LocationFlag`	This field, which is only present in the binary representation, signals the presence of the activation attribute. A value of ”1” means the attribute shall be used and ”0” means the attribute shall not be used.
`maxValue`	Describes the maximum value that the ambient noise sensor can perceive in terms of decibel (dB).
`minValue`	Describes the minimum value that the ambient noise sensor can perceive in terms of decibel (dB).
`Location`	Describes the location of the device from the global coordinate system according to the x-, y-, and z-axis in the unit of meter (m).

6.4.4 Examples

This example shows the description of an ambient noise sensing capability with the following semantics. The sensor has an ID of “ANS001” and the maximum value shall be 200 (dB) and the minimum value shall be -100 (dB) with the resolution of 600 levels. The accuracy of the sensor is 0.5 (dB), the offset of sensor is 0.1 (dB). The sensed information is received at the location of (1.00, 1.00, -1.00).

IECNORM.COM : Click to view the full PDF of ISO/IEC 23005-2:2013

© ISO/IEC 2013 – All rights reserved

```
<cidl:SensorDeviceCapability     xsi:type="scdv:AmbientNoiseSensorCapabilityType"
id="ANS001" maxValue="200" minValue="-100" numOfLevels="600" offset="0.1">
   <cidl:Accuracy xsi:type="cidl:ValueAccuracy" value="0.5"/>
   <scdv:Location>
      <mpegvct:X>1.0</mpegvct:X>
      <mpegvct:Y>1.0</mpegvct:Y>
      <mpegvct:Z>-1.0</mpegvct:Z>
   </scdv:Location>
</cidl:SensorDeviceCapability>
```

6.5 Temperature sensor capability type

6.5.1 XML representation syntax

```
<!-- ################################################ -->
<!-- Temperature Sensor capability type               -->
<!-- ################################################ -->
<complexType name="TemperatureSensorCapabilityType">
   <complexContent>
      <extension base="cidl:SensorCapabilityBaseType">
         <sequence>
            <element name="Location" type="mpegvct:Float3DVectorType"
               minOccurs="0"/>
         </sequence>
      </extension>
   </complexContent>
</complexType>
```

6.5.2 Binary representation syntax

TemperatureSensorCapabilityType {	**(Number of bits)**	**(Mnemonic)**
LocationFlag	1	bslbf
SensorCapabilityBase		SensorCapabilityBaseType
if(LocationFlag){		
Location		Float3DVectorType
}		
}		

6.5.3 Semantics

Semantics of the `TemperatureSensorCapabilityType` type:

Name	*Definition*
`TemperatureSensorCapabilityType`	Tool for describing a temperature sensor capability.

IECNORM.COM : Click to view the full PDF of ISO/IEC 23005-2:2013

© ISO/IEC 2013 – All rights reserved

Name	*Definition*
LocationFlag	This field, which is only present in the binary representation, signals the presence of the activation attribute. A value of ”1” means the attribute shall be used and ”0” means the attribute shall not be used.
maxValue	Describes the maximum value that the temperature sensor can perceive in the unit of Celsius (or Fahrenheit).
minValue	Describes the minimum value that the temperature sensor can perceive in the unit of Celsius (or Fahrenheit).
Location	Describes the location of the device from the global coordinate system according to the x-, y-, and z-axis in the unit of meter (m).

6.5.4 Examples

This example shows the description of a temperature sensing capability with the following semantics. The sensor has an ID of “TS001” and the maximum value shall be 120 (°C) and the minimum value shall be -20 (°C) with the resolution of 1400 levels. The accuracy of the sensor is 0.1 (°C). The offset of sensor is 1.0 (°C). The sensed information is received at the location of (1.00, 1.00, -1.00).

```
<cidl:SensorDeviceCapability      xsi:type="scdv:TemperatureSensorCapabilityType"
id="TS001"   maxValue="120"   minValue="-20"   numOfLevels="1400"   offset="1.0"
unit="celsius">
   <cidl:Accuracy xsi:type="cidl:ValueAccuracy" value="0.1"/>
   <scdv:Location>
      <mpegvct:X>1.0</mpegvct:X>
      <mpegvct:Y>1.0</mpegvct:Y>
      <mpegvct:Z>-1.0</mpegvct:Z>
   </scdv:Location>
</cidl:SensorDeviceCapability>
```

6.6 Humidity sensor capability type

6.6.1 XML representation syntax

```
<!-- ################################################ -->
<!-- Humidity sensor capability type                  -->
<!-- ################################################ -->
<complexType name="HumiditySensorCapabilityType">
   <complexContent>
      <extension base="cidl:SensorCapabilityBaseType">
         <sequence>
            <element name="Location" type="mpegvct:Float3DVectorType"
               minOccurs="0"/>
         </sequence>
      </extension>
   </complexContent>
</complexType>
```

IECNORM.COM : Click to view the full PDF of ISO/IEC 23005-2:2013

© ISO/IEC 2013 – All rights reserved

6.6.2 Binary representation syntax

HumiditySensorCapabilityType {	**(Number of bits)**	**(Mnemonic)**
LocationFlag	1	bslbf
SensorCapabilityBase		SensorCapabilityBaseType
if(LocationFlag){		
Location		Float3DVectorType
}		
}		

6.6.3 Semantics

Semantics of the `HumiditySensorCapabilityType` type:

Name	*Definition*
`HumiditySensorCapabilityType`	Tool for describing a humidity sensor capability.
`LocationFlag`	This field, which is only present in the binary representation, signals the presence of the activation attribute. A value of "1" means the attribute shall be used and "0" means the attribute shall not be used.
`maxValue`	Describes the maximum value that the humidity sensor can perceive in the unit of percentage.
`minValue`	Describes the minimum value that the humidity sensor can perceive in the unit of percentage.
`Location`	Describes the location of the device from the global coordinate system according to the x-, y-, and z-axis in the unit of meter (m).

6.6.4 Examples

This example shows the description of a humidity sensing capability with the following semantics. The sensor has an ID of "HS001" and the maximum value shall be 100 (%) and the minimum value shall be 0 (%) with the resolution of 1000 levels. The accuracy of the sensor is 0.1 (%). The offset of sensor is 1.0 (%). The sensed information is received at the location of (1.00, 1.00, -1.00).

```
<cidl:SensorDeviceCapability          xsi:type="scdv:HumiditySensorCapabilityType"
id="HS001" maxValue="100" minValue="0" numOfLevels="1000" offset="1.0">
   <cidl:Accuracy xsi:type="cidl:ValueAccuracy" value="0.1"/>
   <scdv:Location>
      <mpegvct:X>1.0</mpegvct:X>
      <mpegvct:Y>1.0</mpegvct:Y>
      <mpegvct:Z>-1.0</mpegvct:Z>
   </scdv:Location>
</cidl:SensorDeviceCapability>
```

IECNORM.COM : Click to view the full PDF of ISO/IEC 23005-2:2013

© ISO/IEC 2013 – All rights reserved

6.7 Distance sensor capability type

6.7.1 XML representation syntax

```
<!-- ################################################ -->
<!-- Distance Sensor capability type                  -->
<!-- ################################################ -->
<complexType name="DistanceSensorCapabilityType">
   <complexContent>
      <extension base="cidl:SensorCapabilityBaseType">
         <sequence>
            <element name="Location" type="mpegvct:Float3DVectorType"
               minOccurs="0"/>
         </sequence>
      </extension>
   </complexContent>
</complexType>
```

6.7.2 Binary representation syntax

DistanceSensorCapabilityType {	**(Number of bits)**	**(Mnemonic)**
LocationFlag	1	bslbf
SensorCapabilityBase		SensorCapabilityBaseType
if(LocationFlag){		
Location		Float3DVectorType
}		
}		

6.7.3 Semantics

Semantics of the `DistanceSensorCapabilityType` type:

Name	*Definition*
`DistanceSensorCapabilityType`	Tool for describing a distance sensor capability.
`LocationFlag`	This field, which is only present in the binary representation, signals the presence of the activation attribute. A value of ”1” means the attribute shall be used and ”0” means the attribute shall not be used.
`maxValue`	Describes the maximum value that the distance sensor can perceive in the unit of meter.
`minValue`	Describes the minimum value that the distance sensor can perceive in the unit of meter.
`Location`	Describes the location of the device from the global coordinate system according to the x-, y-, and z-axis in the unit of meter (m).

IECNORM.COM : Click to view the full PDF of ISO/IEC 23005-2:2013

© ISO/IEC 2013 – All rights reserved

6.7.4 Examples

This example shows the description of a distance sensing capability with the following semantics. The sensor has an ID of “DS001” and the maximum value shall be 10 (m) and the minimum value shall be 0 (m) with the resolution of 1000 levels. The accuracy of the sensor is 0.01 (m). The offset of sensor is 0.1 (m). The sensed information is received at the location of (1.00, 1.00, -1.00).

```
<cidl:SensorDeviceCapability          xsi:type="scdv:DistanceSensorCapabilityType"
id="DS001" maxValue="10" minValue="0" numOfLevels="1000" offset="0.1">
    <cidl:Accuracy xsi:type="cidl:ValueAccuracy" value="0.01"/>
    <scdv:Location>
        <mpegvct:X>1.0</mpegvct:X>
        <mpegvct:Y>1.0</mpegvct:Y>
        <mpegvct:Z>-1.0</mpegvct:Z>
    </scdv:Location>
</cidl:SensorDeviceCapability>
```

6.8 Atmospheric pressure sensor capability type

6.8.1 XML representation syntax

```
<!-- ################################################ -->
<!-- Atmospheric Pressure Sensor capability type      -->
<!-- ################################################ -->
<complexType name="AtmosphericPressureSensorCapabilityType">
    <complexContent>
        <extension base="cidl:SensorCapabilityBaseType">
            <sequence>
                <element name="Location" type="mpegvct:Float3DVectorType"
                    minOccurs="0"/>
            </sequence>
        </extension>
    </complexContent>
</complexType>
```

IECNORM.COM : Click to view the full PDF of ISO/IEC 23005-2:2013

6.8.2 Binary representation syntax

AtmosphericPressureSensorCapabilityType {	**(Number of bits)**	**(Mnemonic)**
LocationFlag	1	bslbf
SensorCapabilityBase		SensorCapabilityBaseType
if(LocationFlag){		
Location		Float3DVectorType
}		
}		

© ISO/IEC 2013 – All rights reserved

6.8.3 Semantics

Semantics of the `AtmosphericPressureSensorCapabilityType` type:

Name	*Definition*
`AtmosphericPressure SensorCapabilityType`	Tool for describing an atmospheric pressure sensor capability.
`LocationFlag`	This field, which is only present in the binary representation, signals the presence of the activation attribute. A value of "1" means the attribute shall be used and "0" means the attribute shall not be used.
`maxValue`	Describes the maximum value that the atmospheric pressure sensor can perceive in the unit of hectopascal (hPa).
`minValue`	Describes the minimum value that the atmospheric pressure sensor can perceive in the unit of hectopascal (hPa).
`Location`	Describes the location of the device from the global coordinate system according to the x-, y-, and z-axis.

6.8.4 Examples

This example shows the description of an atmospheric pressure sensing capability with the following semantics. The sensor has an ID of "APS001" and the maximum value shall be 1075 (hPa) and the minimum value shall be 910 (hPa) with the resolution of 1650 levels. The accuracy of the sensor is 0.1 (hPa). The offset of sensor is 1.0 (hPa). The sensed information is received at the location of (1.00, 1.00, -1.00).

```
<cidl:SensorDeviceCapability
xsi:type="scdv:AtmosphericPressureSensorCapabilityType"                id="APS001"
maxValue="1075.0" minValue="910.0" numOfLevels="1650" offset="1.0">
   <cidl:Accuracy xsi:type="cidl:ValueAccuracy" value="0.1"/>
   <scdv:Location>
      <mpegvct:X>1.0</mpegvct:X>
      <mpegvct:Y>1.0</mpegvct:Y>
      <mpegvct:Z>-1.0</mpegvct:Z>
   </scdv:Location>
</cidl:SensorDeviceCapability>
```

6.9 Position sensor capability type

6.9.1 XML representation syntax

```
<!-- ################################################ -->
<!-- Position Sensor capability type                  -->
<!-- ################################################ -->
<complexType name="PositionSensorCapabilityType">
   <complexContent>
      <extension base="cidl:SensorCapabilityBaseType">
         <sequence>
            <element name="Range" type="scdv:RangeType"/>
         </sequence>
```

IECNORM.COM : Click to view the full PDF of ISO/IEC 23005-2:2013

© ISO/IEC 2013 – All rights reserved

```
        </extension>
    </complexContent>
</complexType>

<complexType name="RangeType">
    <sequence>
        <element name="XminValue" type="float"/>
        <element name="XmaxValue" type="float"/>
        <element name="YminValue" type="float"/>
        <element name="YmaxValue" type="float"/>
        <element name="ZminValue" type="float"/>
        <element name="ZmaxValue" type="float"/>
    </sequence>
</complexType>
```

6.9.2 Binary representation syntax

PositionSensorCapabilityType {	**(Number of bits)**	**(Mnemonic)**
SensorCapabilityBase		SensorCapabilityBaseType
range		RangeType
}		
RangeType {		
XminValue	32	fsbf
XmaxValue	32	fsbf
YminValue	32	fsbf
YmaxValue	32	fsbf
ZminValue	32	fsbf
ZmaxValue	32	fsbf
}		

IECNORM.COM : Click to view the full PDF of ISO/IEC 23005-2:2013

6.9.3 Semantics

Semantics of the `PositionSensorCapabilityType` type:

Name	*Definition*
`PositionSensorCapabilityType`	Tool for describing a position sensor capability.
`unit`	Describes the unit of the sensor's measuring value. Specifies the unit of the sensor's measuring value as a reference to a classification scheme term provided by UnitTypeCS defined in A.2.1 of

© ISO/IEC 2013 – All rights reserved

Name	*Definition*
	ISO/IEC 23005-6, if a unit other than the default unit specified in the semantics of the `XmaxValue/YmaxValue/ZmaxValue` and `XminValue/YminValue/ZminValue` is used. The reference to the classification scheme shall be done using the `mpeg7:termReferenceType` defined in 7.6 of ISO/IEC 15938-5:2003.
`Range`	Describes the range that the position sensor can perceive in terms of RangeType in its global coordinate system. NOTE The `minValue` and the `maxValue` in the `SensorCapabilityBaseType` are not used for this sensor.
`RangeType`	Defines the range in a local coordinate system relative to the position of the sensor in idle state according to the x-, y-, and z-axis.
`XminValue`	Describes the minimum value that the position sensor can perceive along the x-axis in the unit of meter.
`XmaxValue`	Describes the maximum value that the position sensor can perceive along the x-axis in the unit of meter.
`YminValue`	Describes the minimum value that the position sensor can perceive along the y-axis in the unit of meter.
`YmaxValue`	Describes the maximum value that the position sensor can perceive along the y-axis in the unit of meter.
`ZminValue`	Describes the minimum value that the position sensor can perceive along the z-axis in the unit of meter.
`ZmaxValue`	Describes the maximum value that the position sensor can perceive along the z-axis in the unit of meter.

6.9.4 Examples

This example shows the description of a position sensing capability with the following semantics. The sensor has an ID of "PS001" and the maximum value shall be `XmaxValue`="10.0", `YmaxValue`="10.0" and `ZmaxValue`="10.0" (m), and the minimum value shall be `XminValue`="-10.0", `YminValue`="-10.0" and `ZminValue`="-10.0" (m) with the resolution of 2000 levels. The accuracy of the sensor is 0.01 (m). The SNR of the sensor is 0.1 (dB). The offset of sensor is 1.0 (m).

```
<cidl:SensorDeviceCapability          xsi:type="scdv:PositionSensorCapabilityType"
id="PS001" numOfLevels="2000" SNR="0.1" offset="1.0">
   <cidl:Accuracy xsi:type="cidl:ValueAccuracy" value="0.01"/>
   <scdv:Range xsi:type="scdv:RangeType">
      <scdv:XminValue>-10.0</scdv:XminValue>
      <scdv:XmaxValue>10.0</scdv:XmaxValue>
      <scdv:YminValue>-10.0</scdv:YminValue>
      <scdv:YmaxValue>10.0</scdv:YmaxValue>
      <scdv:ZminValue>-10.0</scdv:ZminValue>
      <scdv:ZmaxValue>10.0</scdv:ZmaxValue>
   </scdv:Range>
</cidl:SensorDeviceCapability>
```

IECNORM.COM : Click to view the full PDF of ISO/IEC 23005-2:2013

© ISO/IEC 2013 – All rights reserved

6.10 Velocity sensor capability type

6.10.1 XML representation syntax

```
<!-- ################################################ -->
<!-- Velocity Sensor capability type                  -->
<!-- ################################################ -->
<complexType name="VelocitySensorCapabilityType">
   <complexContent>
      <extension base="cidl:SensorCapabilityBaseType"/>
   </complexContent>
</complexType>
```

6.10.2 Binary representation syntax

VelocitySensorCapabilityType {	**(Number of bits)**	**(Mnemonic)**
SensorCapabilityBase		SensorCapabilityBaseType
}		

6.10.3 Semantics

Semantics of the `VelocitySensorCapabilityType` type:

Name	*Definition*
`VelocitySensorCapabilityType`	Tool for describing a velocity sensor capability.
`maxValue`	Describes the maximum value that the velocity sensor can perceive in terms of meter/second for the given axis.
`minValue`	Describes the minimum value that the velocity sensor can perceive in terms of meter/second for the given axis.

6.10.4 Examples

This example shows the description of a velocity sensing capability with the following semantics. The sensor has an ID of “VS001” and the maximum value shall be 50 (m/s) and the minimum value shall be 0.1 (m/s) with the resolution of 5000 levels. The accuracy of the sensor is 0.01 (m/s). The offset of sensor is 0.5 (m/s).

```
<cidl:SensorDeviceCapability          xsi:type="scdv:VelocitySensorCapabilityType"
id="VS001" maxValue="50.0" minValue="0.1" numOfLevels="5000" offset="0.5">
   <cidl:Accuracy xsi:type="cidl:ValueAccuracy" value="0.01"/>
</cidl:SensorDeviceCapability>
```

IECNORM.COM : Click to view the full PDF of ISO/IEC 23005-2:2013

© ISO/IEC 2013 – All rights reserved

6.11 Acceleration sensor capability type

6.11.1 XML representation syntax

```
<!-- ################################################ -->
<!-- Acceleration Sensor capability type              -->
<!-- ################################################ -->
<complexType name="AccelerationSensorCapabilityType">
   <complexContent>
      <extension base="cidl:SensorCapabilityBaseType"/>
   </complexContent>
</complexType>
```

6.11.2 Binary representation syntax

AccelerationSensorCapabilityType {	**(Number of bits)**	**(Mnemonic)**
SensorCapabilityBase		SensorCapabilityBaseType
}		

6.11.3 Semantics

Semantics of the `AccelerationSensorCapabilityType` type:

Name	*Definition*
`AccelerationSensorCapabilityType`	Tool for describing an acceleration sensor capability.
`maxValue`	Describes the maximum value that the acceleration sensor can perceive in terms of meter/second^2 for the given axis.
`minValue`	Describes the minimum value that the acceleration sensor can perceive in terms of meter/second^2 for the given axis.

6.11.4 Examples

This example shows the description of an acceleration sensing capability with the following semantics. The sensor has an ID of “AS001” and the maximum value shall be 9.8 (m/s^2) and the minimum value shall be -9.8 (m/s^2) with the resolution of 1000 levels. The accuracy of the sensor is 0.01 (m/s^2). The offset of sensor is 0.5 (m/s^2).

```
<cidl:SensorDeviceCapability     xsi:type="scdv:AccelerationSensorCapabilityType"
id="AS001" maxValue="9.8" minValue="-9.8" numOfLevels="1000" offset="0.5">
   <cidl:Accuracy xsi:type="cidl:ValueAccuracy" value="0.01"/>
</cidl:SensorDeviceCapability>
```

IECNORM.COM : Click to view the full PDF of ISO/IEC 23005-2:2013

© ISO/IEC 2013 – All rights reserved

6.12 Orientation sensor capability type

6.12.1 XML representation syntax

```
<!-- ################################################ -->
<!-- Orientation Sensor capability type               -->
<!-- ################################################ -->
<complexType name="OrientationSensorCapabilityType">
   <complexContent>
      <extension base="cidl:SensorCapabilityBaseType">
         <sequence>
            <element name="OrientationRange" type="scdv:OrientationRangeType"/>
         </sequence>
      </extension>
   </complexContent>
</complexType>

<complexType name="OrientationRangeType">
   <sequence>
      <element name="YawMin" type="float"/>
      <element name="YawMax" type="float"/>
      <element name="PitchMin" type="float"/>
      <element name="PitchMax" type="float"/>
      <element name="RollMin" type="float"/>
      <element name="RollMax" type="float"/>
   </sequence>
</complexType>
```

6.12.2 Binary representation syntax

OrientationSensorCapabilityType {	**(Number of bits)**	**(Mnemonic)**
SensorCapabilityBase		SensorCapabilityBaseType
OrientationRange		OrientationRangeType
}		
OrientationRangeType {		
YawMin	32	fsbf
YawMax	32	fsbf
PitchMin	32	fsbf
PitchMax	32	fsbf
RollMin	32	fsbf
RollMax	32	fsbf
}		

IECNORM.COM : Click to view the full PDF of ISO/IEC 23005-2:2013

© ISO/IEC 2013 – All rights reserved

6.12.3 Semantics

Semantics of the `OrientationSensorCapabilityType` type:

Name	*Definition*
`OrientationSensorCapabilityType`	Tool for describing an orientation sensor capability.
`OrientationRange`	Describes the range that the orientation sensor can perceive in terms of OrientationRangeType.
`OrientationRangeType`	Defines the range from the local coordinate system according to the Yaw, Pitch and Roll.
`YawMin`	Describes the minimum value that the orientation sensor can perceive for Yaw in the unit of degree.
`YawMax`	Describes the maximum value that the orientation sensor can perceive for Yaw in the unit of degree.
`PitchMin`	Describes the minimum value that the orientation sensor can perceive for Pitch in the unit of degree.
`PitchMax`	Describes the maximum value that the orientation sensor can perceive for Pitch in the unit of degree.
`RollMin`	Describes the minimum value that the orientation sensor can perceive for Roll in the unit of degree.
`RollMax`	Describes the maximum value that the orientation sensor can perceive for Roll in the unit of degree.

NOTE 1 The local coordinate system is defined as right-handed coordinate system.

NOTE 2 Since the sensor has multidimensional information, the `OrientationRangeType` defined in this Subclause shall be used to describe the range of the possible value instead of the `minValue` and the `maxValue` in the `SensorCapabilityBaseType` for this sensor.

6.12.4 Examples

This example shows the description of an orientation sensing capability with the following semantics. The sensor has an ID of “OS001” and the maximum value shall be YawMax ="10.0", PitchMax ="10.0" and RollMax ="10.0" (rad), and the minimum value shall be YawMin ="-10.0", PitchMin ="-10.0" and RollMin ="-10.0" (rad) with the resolution of 1000 levels. The accuracy of the sensor is 0.01 (rad). The SNR of the sensor is 0.1 (dB). The offset of sensor is 1.0 (rad).

```
<cidl:SensorDeviceCapability      xsi:type="scdv:OrientationSensorCapabilityType"
id="OS001" unit="radian" numOfLevels="1000" SNR="0.1" offset="1.0">
   <cidl:Accuracy xsi:type="cidl:ValueAccuracy" value="0.01"/>
   <scdv:OrientationRange xsi:type="scdv:OrientationRangeType">
      <scdv:YawMin>-10.0</scdv:YawMin>
      <scdv:YawMax>10.0</scdv:YawMax>
      <scdv:PitchMin>-10.0</scdv:PitchMin>
      <scdv:PitchMax>10.0</scdv:PitchMax>
      <scdv:RollMin>-10.0</scdv:RollMin>
      <scdv:RollMax>10.0</scdv:RollMax>
```

IECNORM.COM : Click to view the full PDF of ISO/IEC 23005-2:2013

© ISO/IEC 2013 – All rights reserved

```
    </scdv:OrientationRange>
</cidl:SensorDeviceCapability>
```

6.13 Angular velocity sensor capability type

6.13.1 XML representation syntax

```
<!-- ################################################ -->
<!-- Angular Velocity Sensor capability type          -->
<!-- ################################################ -->
<complexType name="AngularVelocitySensorCapabilityType">
    <complexContent>
        <extension base="cidl:SensorCapabilityBaseType"/>
    </complexContent>
</complexType>
```

6.13.2 Binary representation syntax

AngularVelocitySensorCapabilityType {	**(Number of bits)**	**(Mnemonic)**
SensorCapabilityBase		SensorCapabilityBaseType
}		

6.13.3 Semantics

Semantics of the `AngularVelocitySensorCapabilityType` type:

Name	*Definition*
`AngularVelocity SensorCapabilityType`	Tool for describing an angular velocity sensor capability.
`maxValue`	Describes the maximum value that the angular velocity sensor can perceive in terms of radian/second for each axis.
`minValue`	Describes the minimum value that the angular velocity sensor can perceive in terms of radian/second for each axis.

6.13.4 Examples

This example shows the description of an angular velocity sensing capability with the following semantics. The sensor has an ID of “AVS001” and the maximum value shall be 5.0 (rad/s) and the minimum value shall be -5.0 (rad/s) with the resolution of 1000 levels. The accuracy of the sensor is 0.01 (rad/s). The offset of sensor is 0.01 (rad/s).

```
<cidl:SensorDeviceCapability xsi:type="scdv:AngularVelocitySensorCapabilityType"
id="AVS001" unit="radpersec" maxValue="5.0" minValue="-5.0" numOfLevels="1000"
offset="0.01">
```

IECNORM.COM : Click to view the full PDF of ISO/IEC 23005-2:2013

© ISO/IEC 2013 – All rights reserved

```
    <cidl:Accuracy xsi:type="cidl:ValueAccuracy" value="0.01"/>
</cidl:SensorDeviceCapability>
```

6.14 Angular acceleration sensor capability type

6.14.1 XML representation syntax

```
<!-- ################################################ -->
<!-- Angular Acceleration Sensor capability type      -->
<!-- ################################################ -->
<complexType name="AngularAccelerationSensorCapabilityType">
    <complexContent>
        <extension base="cidl:SensorCapabilityBaseType"/>
    </complexContent>
</complexType>
```

6.14.2 Binary representation syntax

AngularAccelerationSensorCapabilityType {	**(Number of bits)**	**(Mnemonic)**
SensorCapabilityBase		SensorCapabilityBaseType
}		

6.14.3 Semantics

Semantics of the `AngularAccelerationSensorCapabilityType` type:

Name	*Definition*
`AngularAcceleration SensorCapabilityType`	Tool for describing an angular acceleration sensor capability.
`maxValue`	Describes the maximum value that the angular acceleration sensor can perceive in terms of radian/second^2 for each axis.
`minValue`	Describes the minimum value that the angular acceleration sensor can perceive in terms of radian/second^2 for each axis.

6.14.4 Examples

This example shows the description of an angular acceleration sensing capability with the following semantics. The sensor has an ID of “AAS001” and the maximum value shall be 200.0 (rad/s^2) and the minimum value shall be -200.0 (rad/s^2) with the resolution of 1000 levels. The accuracy of the sensor is 0.1 (rad/s^2). The offset of sensor is 0.5 (rad/s^2).

```
<cidl:SensorDeviceCapability
xsi:type="scdv:AngularAccelerationSensorCapabilityType"                id="AAS001"
```

IECNORM.COM : Click to view the full PDF of ISO/IEC 23005-2:2013

© ISO/IEC 2013 – All rights reserved

```
unit="radpersecsquared"  maxValue="200.0"  minValue="-200.0"  numOfLevels="1000"
offset="0.5">
   <cidl:Accuracy xsi:type="cidl:ValueAccuracy" value="0.1"/>
</cidl:SensorDeviceCapability>
```

6.15 Force sensor capability type

6.15.1 XML representation syntax

```
<!-- ################################################ -->
<!-- Force Sensor capability type                     -->
<!-- ################################################ -->
<complexType name="ForceSensorCapabilityType">
   <complexContent>
      <extension base="cidl:SensorCapabilityBaseType"/>
   </complexContent>
</complexType>
```

6.15.2 Binary representation syntax

ForceSensorCapabilityType {	**(Number of bits)**	**(Mnemonic)**
SensorCapabilityBase		SensorCapabilityBaseType
}		

6.15.3 Semantics

Semantics of the `ForceSensorCapabilityType`:

Name	*Definition*
`ForceSensorCapabilityType`	Tool for describing a force sensor capability.
`maxValue`	Describes the maximum value that the force sensor can perceive in terms of N (Newton) for each axis.
`minValue`	Describes the minimum value that the force sensor can perceive in terms of N (Newton) for each axis.

6.15.4 Examples

This example shows the description of a force sensing capability with the following semantics. The sensor has an ID of “FS001” and the maximum value shall be 5.0 (N) and the minimum value shall be 0.0 (N) with the resolution of 500 levels. The accuracy of the sensor is 0.01 (N). The offset of sensor is 0.05 (N).

```
<cidl:SensorDeviceCapability xsi:type="scdv:ForceSensorCapabilityType" id="FS001"
maxValue="5.0" minValue="0.0" numOfLevels="500" offset="0.05">
   <cidl:Accuracy xsi:type="cidl:ValueAccuracy" value="0.1"/>
```

IECNORM.COM : Click to view the full PDF of ISO/IEC 23005-2:2013

© ISO/IEC 2013 – All rights reserved

```
</cidl:SensorDeviceCapability>
```

6.16 Torque sensor capability type

6.16.1 XML representation syntax

```
<!-- ################################################ -->
<!-- Torque Sensor capability type                    -->
<!-- ################################################ -->
<complexType name="TorqueSensorCapabilityType">
   <complexContent>
      <extension base="cidl:SensorCapabilityBaseType"/>
   </complexContent>
</complexType>
```

6.16.2 Binary representation syntax

TorqueSensorCapabilityType {	**(Number of bits)**	**(Mnemonic)**
SensorCapabilityBase		SensorCapabilityBaseType
}		

6.16.3 Semantics

Semantics of the `TorqueSensorCapabilityType`:

Name	*Definition*
`TorqueSensorCapabilityType`	Tool for describing a torque sensor capability.
`maxValue`	Describes the maximum value that the torque sensor can perceive in terms of N-mm (Newton millimeter) for each axis.
`minValue`	Describes the minimum value that the torque sensor can perceive in terms of N-mm (Newton millimeter) for each axis.

IECNORM.COM : Click to view the full PDF of ISO/IEC 23005-2:2013

6.16.4 Examples

This example shows the description of a torque sensing capability with the following semantics. The sensor has an ID of “TS001” and the maximum value shall be 200.0 (Nmm) and the minimum value shall be 0.0 (Nmm) with the resolution of 20000 levels. The accuracy of the sensor is 0.01 (Nmm). The offset of sensor is 0.05 (Nmm).

```
<cidl:SensorDeviceCapability          xsi:type="scdv:TorqueSensorCapabilityType"
id="ToS001" maxValue="200.0" minValue="0.0" numOfLevels="20000" offset="0.05">
   <cidl:Accuracy xsi:type="cidl:ValueAccuracy" value="0.01"/>
</cidl:SensorDeviceCapability>
```


© ISO/IEC 2013 – All rights reserved

6.17 Pressure sensor capability type

6.17.1 XML representation syntax

```
<!-- ################################################ -->
<!-- Pressure Sensor capability type                  -->
<!-- ################################################ -->
<complexType name="PressureSensorCapabilityType">
   <complexContent>
      <extension base="cidl:SensorCapabilityBaseType"/>
   </complexContent>
</complexType>
```

6.17.2 Binary representation syntax

PressureSensorCapabilityType {	**(Number of bits)**	**(Mnemonic)**
SensorCapabilityBase		SensorCapabilityBaseType
}		

6.17.3 Semantics

Semantics of the `PressureSensorCapabilityType`:

Name	*Definition*
`PressureSensor CapabilityType`	Tool for describing a pressure sensor capability.
`maxValue`	Describes the maximum value that the pressure sensor can perceive in terms of N/mm^2 (Newton/millimeter square) for each axis.
`minValue`	Describes the minimum value that the pressure sensor can perceive in terms of N/mm^2 (Newton/millimeter square) for each axis.

6.17.4 Examples

This example shows the description of a pressure sensing capability with the following semantics. The sensor has an ID of "PRS001" and the maximum value shall be 2.5 (N/mm^2) and the minimum value shall be 0.0 (N/mm^2) with the resolution of 2500 levels. The accuracy of the sensor is 0.001 (N/mm^2). The offset of sensor is 0.05 (N/mm^2).

```
<cidl:SensorDeviceCapability          xsi:type="scdv:PressureSensorCapabilityType"
id="PRS001" maxValue="2.5" minValue="0.0" numOfLevels="2500" offset="0.05">
   <cidl:Accuracy xsi:type="cidl:ValueAccuracy" value="0.001"/>
</cidl:SensorDeviceCapability>
```

IECNORM.COM : Click to view the full PDF of ISO/IEC 23005-2:2013

© ISO/IEC 2013 – All rights reserved

6.18 Motion sensor capability type

6.18.1 XML representation syntax

```
<!-- ################################################ -->
<!-- Motion Sensor capability type                    -->
<!-- ################################################ -->
<complexType name="MotionSensorCapabilityType">
   <complexContent>
      <extension base="cidl:SensorCapabilityBaseType">
         <sequence>
            <element name="PositionCapability"
               type="scdv:PositionSensorCapabilityType" minOccurs="0"/>
            <element name="OrientationCapability"
               type="scdv:OrientationSensorCapabilityType" minOccurs="0"/>
            <element name="VelocityCapability"
               type="scdv:VelocitySensorCapabilityType" minOccurs="0"/>
            <element name="AngularVelocityCapability"
               type="scdv:AngularVelocitySensorCapabilityType" minOccurs="0"/>
            <element name="AccelerationCapability"
               type="scdv:AccelerationSensorCapabilityType" minOccurs="0"/>
            <element name="AngularAccelerationCapability"
               type="scdv:AngularAccelerationSensorCapabilityType"
               minOccurs="0"/>
         </sequence>
      </extension>
   </complexContent>
</complexType>
```

6.18.2 Binary representation syntax

MotionSensorCapabilityType {	**(Number of bits)**	**(Mnemonic)**
PositionCapabilityFlag	1	bslbf
OrientationCapabilityFlag	1	bslbf
VelocityCapabilityFlag	1	bslbf
AngularVelocityCapabilityFlag	1	bslbf
AccelerationCapabilityFlag	1	bslbf
AngularAccelerationCapabilityFlag	1	bslbf
SensorCapabilityBase		SensorCapabilityBaseType
if(PositionCapabilityFlag){		
PositionCapability		PositionSensorCapabilityType
}		
if(OrientationCapabilityFlag){		

IECNORM.COM : Click to view the full PDF of ISO/IEC 23005-2:2013

© ISO/IEC 2013 – All rights reserved

MotionSensorCapabilityType {	**(Number of bits)**	**(Mnemonic)**
OrientationCapability		OrientationSensorCapabilityType
}		
if(VelocityCapabilityFlag){		
VelocityCapability		VelocitySensorCapabilityType
}		
if(AngularVelocityCapabilityFlag){		
AngularVelocityCapability		AngularVelocitySensorCapabilityType
}		
if(AccelerationCapabilityFlag){		
AccelerationCapability		AccelerationSensorCapabilityType
}		
if(AngularAccelerationCapabilityFlag){		
AngularAccelerationCapability		AngularAccelerationSensorCapabilityType
}		
}		

IECNORM.COM : Click to view the full PDF of ISO/IEC 23005-2:2013

6.18.3 Semantics

Semantics of the `MotionSensorCapabilityType` type:

Name	*Definition*
`MotionSensorCapabilityType`	Tool for describing a motion sensor capability.
`PositionCapabilityFlag`	This field, which is only present in the binary representation, signals the presence of the activation attribute. A value of "1" means the attribute shall be used and "0" means the attribute shall not be used.
`OrientationCapabilityFlag`	This field, which is only present in the binary representation, signals the presence of the activation attribute. A value of "1" means the attribute shall be used and "0" means the attribute shall not be used.
`VelocityCapabilityFlag`	This field, which is only present in the binary representation, signals the presence of the activation attribute. A value of "1" means the attribute shall be used and "0" means the attribute shall not be used.
`AngularVelocityCapabilityFlag`	This field, which is only present in the binary representation, signals the presence of the activation attribute. A value of "1" means the attribute shall

© ISO/IEC 2013 – All rights reserved

Name	*Definition*
	be used and ”0” means the attribute shall not be used.
AccelerationCapability Flag	This field, which is only present in the binary representation, signals the presence of the activation attribute. A value of ”1” means the attribute shall be used and ”0” means the attribute shall not be used.
AngularAccelerationCap abilityFlag	This field, which is only present in the binary representation, signals the presence of the activation attribute. A value of ”1” means the attribute shall be used and ”0” means the attribute shall not be used.
PositionCapability	Describes the capability with respect to the position as defined in PositionSensorCapabilityType.
OrientationCapability	Describes the capability with respect to the orientation as defined in OrientationSensorCapabilityType.
VelocityCapability	Describes the capability with respect to the velocity as defined in VelocitySensorCapabilityType.
AngularVelocity Capability	Describes the capability with respect to the angular as defined in AngularVelocitySensorCapabilityType.
AccelerationCapability	Describes the capability with respect to the acceleration as defined in AccelerationSensorCapabilityType.
AngularAcceleration Capability	Describes the capability with respect to the angular acceleration as defined in AngularAccelerationSensorCapabilityType.

6.18.4 Examples

This example shows the description of a motion sensing capability with the following semantics. The motion sensor is with id of “MS001”. It is composed of position sensor with id “MSPC001”, orientation sensor with id “MSOC001”, velocity sensor with id “MSVC0001”, angular velocity sensor with id “MSAVC0001”, acceleration sensor with id “MSAC0001”, and angular acceleration sensor with id “MSAAC0001”.

```
<cidl:SensorDeviceCapability          xsi:type="scdv:MotionSensorCapabilityType"
id="MS001">
   <scdv:PositionCapability id="MSPC001" SNR="0.1" numOfLevels="10000"
   xsi:type="scdv:PositionSensorCapabilityType">
      <cidl:Accuracy xsi:type="cidl:ValueAccuracy" value="0.1"/>
      <scdv:Range xsi:type="scdv:RangeType">
         <scdv:XminValue>0.0</scdv:XminValue>
         <scdv:XmaxValue>3.0</scdv:XmaxValue>
         <scdv:YminValue>0.0</scdv:YminValue>
         <scdv:YmaxValue>3.0</scdv:YmaxValue>
         <scdv:ZminValue>0.0</scdv:ZminValue>
         <scdv:ZmaxValue>3.0</scdv:ZmaxValue>
      </scdv:Range>
```

IECNORM.COM : Click to view the full PDF of ISO/IEC 23005-2:2013

© ISO/IEC 2013 – All rights reserved

```
    </scdv:PositionCapability>
    <scdv:OrientationCapability id="MSOC001" SNR="0.1" unit="radian"
    numOfLevels="10000" xsi:type="scdv:OrientationSensorCapabilityType">
        <cidl:Accuracy xsi:type="cidl:ValueAccuracy" value="0.1"/>
        <scdv:OrientationRange>
            <scdv:YawMin>-3.14</scdv:YawMin>
            <scdv:YawMax>3.14</scdv:YawMax>
            <scdv:PitchMin>-3.14</scdv:PitchMin>
            <scdv:PitchMax>3.14</scdv:PitchMax>
            <scdv:RollMin>-1.57</scdv:RollMin>
            <scdv:RollMax>1.57</scdv:RollMax>
        </scdv:OrientationRange>
    </scdv:OrientationCapability>
    <scdv:VelocityCapability id="MSVC0001"
    xsi:type="scdv:VelocitySensorCapabilityType" maxValue="50.0" minValue="0.1"
    numOfLevels="1000">
        <cidl:Accuracy xsi:type="cidl:ValueAccuracy" value="0.1"/>
    </scdv:VelocityCapability>
    <scdv:AngularVelocityCapability id="MSAVC0001"
    xsi:type="scdv:AngularVelocitySensorCapabilityType" maxValue="5.0"
    minValue="-5.0">
        <cidl:Accuracy xsi:type="cidl:ValueAccuracy" value="0.1"/>
    </scdv:AngularVelocityCapability>
    <scdv:AccelerationCapability id="MSAC0001" maxValue="9.8" minValue="-9.8"/>
    <scdv:AngularAccelerationCapability id="MSAAC0001" maxValue="200.0"
    minValue="-200.0"/>
</cidl:SensorDeviceCapability>
```

IECNORM.COM : Click to view the full PDF of ISO/IEC 23005-2:2013

6.19 Intelligent camera capability type

6.19.1 XML representation syntax

```
<!-- ################################################ -->
<!-- Intelligent Camera CapabilityType                -->
<!-- ################################################ -->
<complexType name="IntelligentCameraCapabilityType">
    <complexContent>
        <extension base="cidl:SensorCapabilityBaseType">
            <sequence>
                <element name="MaxBodyFeaturePoint" type="nonNegativeInteger"
                    minOccurs="0"/>
                <element name="MaxFaceFeaturePoint" type="nonNegativeInteger"
                    minOccurs="0"/>
                <element name="TrackedFeature" type="scdv:FeatureType"
                    minOccurs="0"/>
                <element name="TrackedFacialFeaturePoints"
                    type="scdv:FacialFeatureMask" minOccurs="0"/>
                <element name="TrackedBodyFeaturePoints"
                    type="scdv:BodyFeatureMask" minOccurs="0"/>
            </sequence>
            <attribute name="featureTrackingStatus" type="boolean" use="optional"
                default="false"/>
            <attribute name="facialExpressionTrackingStatus" type="boolean"
                use="optional" default="false"/>
            <attribute name="gestureTrackingStatus"  type="boolean"  use="optional"
                default="false"/>
```

© ISO/IEC 2013 – All rights reserved

```
        </extension>
    </complexContent>
</complexType>

<simpleType name="FeatureType">
    <restriction base="string">
        <enumeration value="face"/>
        <enumeration value="body"/>
        <enumeration value="both"/>
    </restriction>
</simpleType>

<complexType name="FacialFeatureMask">
    <sequence>
        <element name="FaceFeaturePoint" type="boolean" minOccurs="60"
            maxOccurs="200"/>
    </sequence>
</complexType>

<complexType name="BodyFeatureMask">
    <sequence>
        <element name="BodyFeaturePoint" type="boolean" minOccurs="60"
            maxOccurs="200"/>
    </sequence>
</complexType>
```

6.19.2 Binary representation syntax

IntelligentCameraCapabilityType {	**(Number of bits)**	**(Mnemonic)**
MaxBodyFeaturePointFlag	1	bslbf
MaxFaceFeaturePointFlag	1	bslbf
TrackedFeatureFlag	1	bslbf
TrackedFacialFeaturePointsFlag	1	bslbf
TrackedBodyFeaturePointsFlag	1	bslbf
featureTrackingStatusFlag		
facialExpressionTrackingStatusFlag	1	bslbf
gestureTrackingStatusFlag	1	bslbf
SensorCapabilityBase		SensorCapabilityBaseType
if(MaxBodyFeaturePointFlag){		
MaxBodyFeaturePoint	32	uimsbf
}		
if(MaxFaceFeaturePointFlag){		

IECNORM.COM : Click to view the full PDF of ISO/IEC 23005-2:2013

© ISO/IEC 2013 – All rights reserved

IntelligentCameraCapabilityType {	**(Number of bits)**	**(Mnemonic)**
MaxFaceFeaturePoint	32	uimsbf
}		
if(TrackedFeatureFlag){		
TrackedFeature	2	bslbf
}		
if(TrackedFacialFeaturePointsFlag){		
TrackedFacialFeaturePoints		FacialFeatureMask
}		
if(TrackedBodyFeaturePointsFlag){		
TrackedBodyFeaturePointsFlag		BodyFeatureMask
}		
if(featureTrackingStatusFlag){		
featureTrackingStatus	1	bslbf
}		
if(facialExpressionTrackingStatusFlag){		
facialExpressionTrackingStatus	1	bslbf
}		
if(gestureTrackingStatusFlag){		
gestureTrackingStatus	1	bslbf
}		
}		
FacialFeatureMask {		
LoopFaceFeaturePoint	8	uimsbf
for(k=0;k< LoopFaceFeaturePoint;k++){		
FaceFeaturePoint[k]	1	bslbf
}		
}		

IECNORM.COM : Click to view the full PDF of ISO/IEC 23005-2:2013

© ISO/IEC 2013 – All rights reserved

IntelligentCameraCapabilityType {	**(Number of bits)**	**(Mnemonic)**
BodyFeatureMask {		
LoopBodyFeaturePoint	16	uimsbf
for(k=0;k< LoopBodyFeaturePoint;k++){		
BodyFeaturePoint[k]	1	bslbf
}		
}		

6.19.3 Semantics

Semantics of the `IntelligentCameraCapabilityType` type:

Name	*Definition*
`IntelligentCameraCapabilityType`	Tool for describing an intelligent camera capability.
`MaxBodyFeaturePointFlag`	This field, which is only present in the binary representation, signals the presence of the activation attribute. A value of "1" means the attribute shall be used and "0" means the attribute shall not be used.
`MaxFaceFeaturePointFlag`	This field, which is only present in the binary representation, signals the presence of the activation attribute. A value of "1" means the attribute shall be used and "0" means the attribute shall not be used.
`TrackedFeatureFlag`	This field, which is only present in the binary representation, signals the presence of the activation attribute. A value of "1" means the attribute shall be used and "0" means the attribute shall not be used.
`TrackedFacialFeaturePointsFlag`	This field, which is only present in the binary representation, signals the presence of the activation attribute. A value of "1" means the attribute shall be used and "0" means the attribute shall not be used.
`TrackedBodyFeaturePointsFlag`	This field, which is only present in the binary representation, signals the presence of the activation attribute. A value of "1" means the attribute shall be used and "0" means the attribute shall not be used.
`featureTrackingStatusFlag`	This field, which is only present in the binary representation, signals the presence of the activation attribute. A value of "1" means the attribute shall be used and "0" means the attribute shall not be used.
`facialExpressionTrackingStatusFlag`	This field, which is only present in the binary representation, signals the presence of the activation attribute. A value of "1" means the attribute shall be used and "0" means the attribute shall not be used.
`gestureTrackingStatusFlag`	This field, which is only present in the binary representation, signals the presence of the activation attribute. A value of "1" means the attribute shall be used and "0" means the attribute shall not be used.

IECNORM.COM : Click to view the full PDF of ISO/IEC 23005-2:2013

© ISO/IEC 2013 – All rights reserved

Name	*Definition*
MaxBodyFeaturePoint	Describes the maximum number of body feature points that the intelligent camera can track.
MaxFaceFeaturePoint	Describes the maximum number of facial feature points that the intelligent camera can track.
TrackedFeature	Describes what kind of feature points can be tracked as given in FeatureType, e.g., body, face or both.
FeatureType	Describes the types of feature to be tracked. (face, body, or both). In the binary description, the following mapping table is used.
TrackedFacialFeature Points	Describes whether each of the facial feature points orderly listed in 5.2.7.4 of ISO/IEC 23005-4 is active or not, based on FacialFeatureMask.
TrackedBodyFeature Points	Describes whether each of the body feature points orderly listed in 5.2.7.6 of ISO/IEC 23005-4 is active or not, based on BodyFeatureMask.
featureTracking Status	Describes whether the feature tracking is capable or not.
facialExpression TrackingStatus	Describes whether the intelligent camera can extract the facial animation or not.
gestureTracking Status	Describes whether the intelligent camera can extract the body animation or not.
FacialFeatureMask	Provides a Boolean map of facial feature points in the order listed in 5.2.7.4 of ISO/IEC 23005-4 to identify active feature points.
BodyFeatureMask	Provides a Boolean map of body feature points in the order listed in 5.2.7.6 of ISO/IEC 23005-4 to identify active feature points.

Term of FeatureType	Binary representation for feature type (2bits)
Face	00
Body	01
Both	10
Reserved	11

IECNORM.COM : Click to view the full PDF of ISO/IEC 23005-2:2013

6.19.4 Examples

This example shows the description of an intelligent camera sensing capability.

```
<cidl:SensorDeviceCapability      xsi:type="scdv:IntelligentCameraCapabilityType"
id="IC001" featureTrackingStatus="true"  gestureTrackingStatus="true">
   <scdv:MaxBodyFeaturePoint>69</scdv:MaxBodyFeaturePoint>
   <scdv:MaxFaceFeaturePoint>60</scdv:MaxFaceFeaturePoint>
```

© ISO/IEC 2013 – All rights reserved

```
    <scdv:TrackedFeature>both</scdv:TrackedFeature>
    <scdv:TrackedFacialFeaturePoints>
        <scdv:FaceFeaturePoint>true</scdv:FaceFeaturePoint>
        <scdv:FaceFeaturePoint>true</scdv:FaceFeaturePoint>
        <scdv:FaceFeaturePoint>true</scdv:FaceFeaturePoint>
        …
        <scdv:FaceFeaturePoint>true</scdv:FaceFeaturePoint>
        <scdv:FaceFeaturePoint>true</scdv:FaceFeaturePoint>
        <scdv:FaceFeaturePoint>true</scdv:FaceFeaturePoint>
    </scdv:TrackedFacialFeaturePoints>
    <scdv:TrackedBodyFeaturePoints>
        <scdv:BodyFeaturePoint>true</scdv:BodyFeaturePoint>
        <scdv:BodyFeaturePoint>true</scdv:BodyFeaturePoint>
        <scdv:BodyFeaturePoint>true</scdv:BodyFeaturePoint>
        …
        <scdv:BodyFeaturePoint>true</scdv:BodyFeaturePoint>
        <scdv:BodyFeaturePoint>true</scdv:BodyFeaturePoint>
        <scdv:BodyFeaturePoint>true</scdv:BodyFeaturePoint>
    </scdv:TrackedBodyFeaturePoints>
</cidl:SensorDeviceCapability>
```

6.20 Bend sensor capability type

6.20.1 XML representation syntax

```
<!-- ################################################ -->
<!-- Bend Sensor capability type                      -->
<!-- ################################################ -->
<complexType name="BendSensorCapabilityType">
   <complexContent>
      <extension base="cidl:SensorCapabilityBaseType">
         <sequence>
            <element name="Channels"
type="scdv:BendSensorChannelCapabilityType" minOccurs="0" maxOccurs="unbounded"/>
         </sequence>
         <attribute name="numOfChannels" type="nonNegativeInteger"
use="optional" default="1"/>
      </extension>
   </complexContent>
</complexType>

<complexType name="BendSensorChannelCapabilityType">
 <complexContent>
  <extension base="cidl:SensorCapabilityBaseType">
   <sequence>
      <element name="NumOfLocations" type="nonNegativeInteger" minOccurs="0"/>
      <element name="DistanceBtwnLocations" type="float" minOccurs="0"/>
      <element name="NumOfAxes" type="nonNegativeInteger" minOccurs="0"/>
   </sequence>
  </extension>
 </complexContent>
</complexType>
```

IECNORM.COM : Click to view the full PDF of ISO/IEC 23005-2:2013

© ISO/IEC 2013 – All rights reserved

6.20.2 Binary representation syntax

BendSensorCapabilityType{	(Number of bits)	(Mnemonic)
ChannelsFlag	1	bslbf
numOfChannelsFlag	1	bslbf
SensorCapabilityBase		SensorCapabilityBaseType
if(ChannelsFlag){		
LoopChannels		Vluimsbf5
for(k=0;k< LoopChannels;k++){		
Channels[k]		BendSensorChannelCapabilityType
}		
}		
if(numOfChannelsFlag){		
numOfChannels	16	uimsbf
}		
}		
BendSensorChannelCapabilityType{		
NumOfLocationsFlag	1	bslbf
DistanceBtwnLocationsFlag	1	bslbf
NumOfAxesFlag	1	bslbf
SensorCapabilityBase		SensorCapabilityBaseType
if(NumOfLocationsFlag){		
NumOfLocations	16	uimsbf
}		
if(DistanceBtwnLocationsFlag){		
DistanceBtwnLocations	32	fsbf
}		
if(NumOfAxesFlag){		
NumOfAxes	2	uimsbf
}		
}		

IECNORM.COM : Click to view the full PDF of ISO/IEC 23005-2:2013

© ISO/IEC 2013 – All rights reserved

6.20.3 Semantics

Semantics of the `BendSensorType`:

Name	*Definition*
`BendSensorCapabilityType`	Tool for describing a bend sensor capability.
`NumOfLocationsFlag`	This field, which is only present in the binary representation, indicates the presence of the "numOfLocations" attribute. A value of "1" implies that the attribute shall be used and a value of "0" implies that the attribute shall not be used.
`DistanceBtwnLocationsFlag`	This field, which is only present in the binary representation, indicates the presence of the "distanceBtwnLocations" attribute. A value of "1" implies that the attribute shall be used and a value of "0" implies that the attribute shall not be used.
`NumOfAxesFlag`	This field, which is only present in the binary representation, indicates the presence of the "numOfAxes" attribute. A value of "1" implies that the attribute shall be used and a value of "0" implies that the attribute shall not be used.
`numOfChannelsFlag`	This field, which is only present in the binary representation, indicates the presence of the "numOfChannels" attribute. A value of "1" implies that the attribute shall be used and a value of "0" implies that the attribute shall not be used.
`maxValue`	Describes the maximum value that the bend sensor can perceive in terms of degree.
`minValue`	Describes the minimum value that the bend sensor can perceive in terms of degree.
`NumOfLocations`	Describes the number of locations that a bend sensor can sense bend angles.
`DistanceBtwnLocations`	Describes the distance between the adjacent sensing locations in terms of meter.
`NumOfAxes`	Describes the dimension that the bend sensor can perceive the bend angles.
`numOfChannels`	Describes the number of channels that an array of bend sensors can perceive. The default value of the number of channels is 1.

IECNORM.COM : Click to view the full PDF of ISO/IEC 23005-2:2013

6.20.4 Examples

This example shows the description of a bend sensing capability with the following semantics. The sensor has an ID of "BendID_01" and the number of channels is 1. The channel has its ID of "Ch1", three sensing locations with a single axis, the distance between the sensing locations of 0.03m, and the maximum and minimum values of 90 and 0 degrees, respectively.

© ISO/IEC 2013 – All rights reserved

```
<cidl:SensorDeviceCapability                xsi:type="scdv:BendSensorCapabilityType"
id="BendID_01" numOfChannels="1">
   <scdv:Channels id="Ch1" maxValue="90" minValue="0">
      <scdv:NumOfLocations>
         3
      </scdv:NumOfLocations>
      <scdv:DistanceBtwnLocations>
         0.03
      </scdv:DistanceBtwnLocations>
      <scdv:NumOfAxes>
         1
      </scdv:NumOfAxes>
   </scdv:Channels>
</cidl:SensorDeviceCapability>
```

6.21 Gas sensor capability type

6.21.1 XML representation syntax

```
<!-- ################################################ -->
<!-- Gas Sensor capability type                       -->
<!-- ################################################ -->
<complexType name="GasSensorCapabilityType">
   <complexContent>
     <extension base="cidl:SensorCapabilityBaseType">
      <sequence>
         <element name="GasType" type="mpeg7:termReferenceType" minOccurs="0"/>
      </sequence>
     </extension>
   </complexContent>
</complexType>
```

6.21.2 Binary representation syntax

GasSensorCapabilityType{	(Number of bits)	(Mnemonic)
GasTypeFlag	1	bslbf
SensorCapabilityBase		SensorCapabilityBaseType
if(GasTypeFlag){		
GasType	16	uimsbf
}		
}		

6.21.3 Semantics

Semantics of the `GasSensorCapabilityType`:

IECNORM.COM : Click to view the full PDF of ISO/IEC 23005-2:2013

© ISO/IEC 2013 – All rights reserved

Name	*Definition*
`GasSensorCapabilityType`	Tool for describing a gas sensor capability.
`GasTypeFlag`	This field, which is only present in the binary representation, signals the presence of the GasType element. A value of ”1” means the element shall be used and ”0” means the element shall not be used.
`GasType`	Describes the sensed type by the gas sensor. Tool for describing a gas type as a reference to a classification scheme term provided by `GasTypeCS` defined in ISO/IEC 23005-6. The details of the structure and use of classification scheme and `termReferencetype` description is defined in 7.6 of ISO/IEC 15938-5:2003. EXAMPLE `urn:mpeg:mpeg-v:01-CI-GasCS-NS:oxygen` would describe Oxygen gas. As for the binary representation, the following table shall be used to identify the gas type in binary representation.

GasTypeCS (16bits)	Type
0000000000000000	Reserved
0000000000000001	carbon monoxide
0000000000000010	carbon dioxide
0000000000000011	sulfurous acid
0000000000000100	nitrogen oxide
0000000000000101	oxygen
0000000000000110	ozone
0000000000000111	hydrogen
0000000000001000	VOC (Volatile Organic Compounds)
0000000000001001	ethanol (chemical symbol of ethanol is C_2H_5OH)
0000000000001010	propane
0000000000001011	methane
0000000000001100	butane
0000000000001101	formaldehyde
0000000000001110	Radon222
0000000000001111-1111111111111111	reserved

IECNORM.COM : Click to view the full PDF of ISO/IEC 23005-2:2013

© ISO/IEC 2013 – All rights reserved

Name	*Definition*
maxValue	Describes the maximum value that the gas sensor can perceive in terms of ppm (parts per million).
minValue	Describes the minimum value that the gas sensor can perceive in terms of ppm (parts per million).

6.21.4 Examples

This example shows the description of a gas sensing capability with the following semantics. The sensor has an ID of "GSID_01" and the maximum value shall be 25.0 (ppm) and the minimum value shall be 0.0 (ppm) with the resolution of 100 levels. The accuracy of the sensor is 0.001 (ppm). The offset of sensor is 0.05 (ppm).

```
<cidl:SensorDeviceCapability xsi:type="scdv:GasSensorCapabilityType" id="GSID_01"
minValue="0.0"        maxValue="25.0"        numOfLevels="100"        offset="0.05"
unit="urn:mpeg:mpeg-v:01-CI-UnitTypeCS-NS:ppm">
   <cidl:Accuracy xsi:type="cidl:ValueAccuracy" value="0.001"/>
</cidl:SensorDeviceCapability>
```

6.22 Dust sensor capability type

6.22.1 XML representation syntax

```
<!-- ################################################ -->
<!-- Dust Sensor capability type                      -->
<!-- ################################################ -->
<complexType name="DustSensorCapabilityType">
   <complexContent>
      <extension base="cidl:SensorCapabilityBaseType"/>
   </complexContent>
</complexType>
```

6.22.2 Binary representation syntax

DustSensorCapabilityType {	**(Number of bits)**	**(Mnemonic)**
SensorCapabilityBase		SensorCapabilityBaseType
}		

6.22.3 Semantics

Semantics of the DustSensorCapabilityType:

Name	*Definition*
DustSensorCapabilityType	Tool for describing a dust sensor capability.

IECNORM.COM : Click to view the full PDF of ISO/IEC 23005-2:2013

© ISO/IEC 2013 – All rights reserved

Name	*Definition*
maxValue	Describes the maximum value that the dust sensor can perceive in terms of μg/m^3 (micrograms per cubic meter).
minValue	Describes the minimum value that the dust sensor can perceive in terms of μg/m^3 (micrograms per cubic meter).

6.22.4 Examples

This example shows the description of a dust sensing capability with the following semantics. The sensor has an ID of "DTID_01" and the maximum value shall be 1000 (μg/m^3) and the minimum value shall be 1 (μg/m^3) with the resolution of 1000 levels. The accuracy of the sensor is 1 (μg/m^3). The offset of sensor is 5 (μg/m^3).

```
<cidl:SensorDeviceCapability xsi:type="scdv:GasSensorCapabilityType" id="GSID_01"
minValue="1" maxValue="1000" numOfLevels="1000" offset="5" >
   <cidl:Accuracy xsi:type="cidl:ValueAccuracy" value="1"/>
</cidl:SensorDeviceCapability>
```

6.23 Multi interaction point sensor capability type

6.23.1 XML representation syntax

```
<!-- ################################################ -->
<!-- Multi Interaction Point Sensor capability type   -->
<!-- ################################################ -->
<complexType name="MultiInteractionPointSensorCapabilityType">
   <complexContent>
      <extension base="cidl:SensorCapabilityBaseType">
         <attribute name="numOfInteractionPoints" type="nonNegativeInteger"
use="optional" default="1"/>
      </extension>
   </complexContent>
</complexType>
```

6.23.2 Binary representation syntax

MultiInteractionPointSensorCapabilityType {	**(Number of bits)**	**(Mnemonic)**
numOfInteractionPointsFlag	1	bslbf
SensorCapabilityBase		SensorCapabilityBaseType
if(numOfInteractionPointsFlag){		
numOfInteractionPoints	16	uimsbf
}		
}		

IECNORM.COM : Click to view the full PDF of ISO/IEC 23005-2:2013

© ISO/IEC 2013 – All rights reserved

6.23.3 Semantics

Semantics of the `MultiInteractionPointSensorCapabilityType`:

Name	*Definition*
`MultiInteractionPointSensorCapabilityType`	Tool for describing a multi interaction-point sensor capability.
`numOfInteractionPointsFlag`	This field, which is only present in the binary representation, signals the presence of the activation attribute. A value of ”1” means the attribute shall be used and ”0” means the attribute shall not be used.
`numOfInteractionPoints`	Describes the number of interaction points that a multi interaction point sensor includes.

6.23.4 Examples

The following is an example of the MultiInteractionPointSensorCapability to indicate the capable number of interaction points. This example shows that the given Multi Interaction Point Sensor with id of MIPS_ID1 has 5 interaction points to receive user’s selection.

```
<cidl:SensorDeviceCapability
xsi:type="scdv:MultiInteractionPointSensorCapabilityType" id="MIPSID_01"
numOfInteractionPoints="5">
</cidl:SensorDeviceCapability>
```

6.24 Gaze tracking sensor capability type

6.24.1 XML representation syntax

```
<!-- ################################################ -->
<!-- Gaze Tracking Sensor capability type             -->
<!-- ################################################ -->
<complexType name="GazeTrackingSensorCapabilityType">
   <complexContent>
      <extension base="cidl:SensorCapabilityBaseType">
         <sequence>
            <element name="PositionCapability"
type="scdv:PositionSensorCapabilityType" minOccurs="0"/>
            <element name="OrientationCapability"
type="scdv:OrientationSensorCapabilityType" minOccurs="0"/>
         </sequence>
         <attribute name="gazeTrackingOn" type="boolean" use="optional"
default="false"/>
                  <attribute name="blinkTrackingOn" type="boolean" use="optional"
default="false"/>
      </extension>
   </complexContent>
</complexType>
```

IECNORM.COM : Click to view the full PDF of ISO/IEC 23005-2:2013

© ISO/IEC 2013 – All rights reserved

6.24.2 Binary representation syntax

GazeTrackingSensorCapabilityType {	**(Number of bits)**	**(Mnemonic)**
PositionCapabilityFlag	1	bslbf
OrientationCapabilityFlag	1	bslbf
gazeTrackingOnFlag	1	bslbf
blinkTrackingOnFlag	1	bslbf
SensorCapabilityBase		SensorCapabilityBaseType
if(PositionCapabilityFlag){		
PositionCapability		PositionSensorCapabilityType
}		
if(OrientationCapabilityFlag){		
OrientationCapability	1	OrientationSensorCapabilityType
}		
if(gazeTrackingOnFlag){		
gazeTrackingOn	1	bslbf
}		
if(blinkTrackingOnFlag){		
blinkTrackingOn	1	bslbf
}		
}		

IECNORM.COM : Click to view the full PDF of ISO/IEC 23005-2:2013

6.24.3 Semantics

Semantics of the GazeTrackingSensorCapability`Type`:

Name	*Definition*
`GazeTrackingSensorCapabilityType`	Tool for describing a Gaze tracking sensor capability.
`PositionCapabilityFlag`	This field, which is only present in the binary representation, signals the presence of the activation attribute. A value of ”1” means the element shall be used and ”0” means the element shall not be used.

© ISO/IEC 2013 – All rights reserved

<table>
<tr><th>Name</th><th>Definition</th></tr>
<tr><td>OrientationCapabilityFlag</td><td>This field, which is only present in the binary representation, signals the presence of the activation attribute. A value of ”1” means the attribute shall be used and ”0” means the attribute shall not be used.</td></tr>
<tr><td>gazeTrackingOnFlag</td><td>This field, which is only present in the binary representation, signals the presence of the activation attribute. A value of ”1” means the attribute shall be used and ”0” means the attribute shall not be used.</td></tr>
<tr><td>blinkTrackingOnFlag</td><td>This field, which is only present in the binary representation, signals the presence of the activation attribute. A value of ”1” means the attribute shall be used and ”0” means the attribute shall not be used.</td></tr>
<tr><td>PositionCapability</td><td>Describes the capability with respect to the position as defined in PositionSensorCapabilityType</td></tr>
<tr><td>OrientationCapability</td><td>Describes the capability with respect to the orientation as defined in OrientationSensorCapabilityType</td></tr>
<tr><td>gazeTrackingOn</td><td>Indicates whether the gaze tracking sensor can track user’s gazes or not. „false“ means the gaze tracking sensor does not detect the gaze and „true“ means the sensor does detect.

In the binary description, the following mapping table is used,

<table>
<tr><th>Binary value (1 bits)</th><th>whether detecting gaze or not</th></tr>
<tr><td>0</td><td>Not detecting gaze</td></tr>
<tr><td>1</td><td>Detecting gaze</td></tr>
</table>
</td></tr>
<tr><td>blinkTrackingOn</td><td>Indicates whether the gaze tracking sensor can detect the user’s blinking or not. „false“ means the gaze tracking sensor does not detect eye’s blinking and „true“ means the sensor does detect.

In the binary description, the following mapping table is used,

<table>
<tr><th>Binary value (1 bits)</th><th>Whether detecting eye’s blinking or not</th></tr>
<tr><td>0</td><td>Not detecting eye’s blinking</td></tr>
<tr><td>1</td><td>Detecting eye’s blinking</td></tr>
</table>
</td></tr>
</table>

IECNORM.COM : Click to view the full PDF of ISO/IEC 23005-2:2013

6.24.4 Examples

This example shows the description of a gaze tracking sensor capability with the following semantics. The sensor has an ID of “GTS001” and it can track the position and the orientation of user’s gaze while it cannot sense user’s blinking.

```
<cidl:SensorDeviceCapability     xsi:type="scdv:GazeTrackingSensorCapabilityType"
id="GTS001" gazeTrackingOn="true" blinkTrackingOn="false">
</cidl:SensorDeviceCapability>
```

© ISO/IEC 2013 – All rights reserved

6.25 Global position sensor capability type

6.25.1 XML representation syntax

```
<!-- ################################################ -->
<!--  Global Position Sensor capability type          -->
<!-- ################################################ -->
   <complexType name="GlobalPositionSensorCapabilityType">
      <complexContent>
         <extension base="cidl:SensorCapabilityBaseType">
            <sequence>
               <element name="VariousAccuracy" type="scdv:VariousAccuracyType"
minOccurs="0" maxOccurs="unbounded"/>
            </sequence>
            <attribute name="crs" type="anyURI"
default="urn:ogc:def:crs:EPSG::4326"/>
            <attribute name="latitudeOffset" type="float" use="optional"/>
            <attribute name="longitudeOffset" type="float" use="optional"/>
            <attribute name="maxOperatingTemp" type="float" use="optional"/>
            <attribute name="minOperatingTemp" type="float" use="optional"/>
         </extension>
      </complexContent>
   </complexType>

   <complexType name="VariousAccuracyType">
      <attribute name="accuracyType" type="mpeg7:termReferenceType"/>
      <attribute name="value" type="float" use="required"/>
      <attribute name="accuracyUnit" type="mpeg7:termReferenceType"/>
   </complexType>
```

6.25.2 Binary representation syntax

GlobalPositionSensorCapabilityType {	**(Number of bits)**	**(Mnemonic)**
SensoryDeviceCapabilityBase		SensoryDeviceCapabilityBaseType
latitudeOffsetFlag	1	bslbf
longitudeOffstFlag	1	bslbf
maxOperatingTempFlag	1	bslbf
minOperatingTempFlag	1	bslbf
VariousAccuracyCount	32	uimsbf
For (i=1;i<VariousAccuracyCount;i++) {		
accuracyType	8	AccuracyTypeCS
value	32	flbf
accuracyUnit	8	bslbf
}		

IECNORM.COM : Click to view the full PDF of ISO/IEC 23005-2:2013

© ISO/IEC 2013 – All rights reserved

GlobalPositionSensorCapabilityType {	**(Number of bits)**	**(Mnemonic)**
crs		UTF-8
if(latitudeOffsetFlag){		
latitudeOffset	32	fsbf
}		
if(longitudeOffsetFlag){		
longitudeOffset	32	Fsbf
}		
if(maxOperatingTempFlag){		
maxOperatingTemp	32	fsbf
}		
if(minOperatingTempFlag){		
minOperatingTemp	32	fsbf
}		
}		

6.25.3 Semantics

Semantics of the `GlobalPositionSensorCapabilityType`:

Name	*Definition*
`GlobalPositionSensorCapabilityType`	Tool for describing a GPS sensor capability.
`Accuracy`	Describes the degree of closeness of a measured quantity of longitude to its actual value in `AccuracyType`.
`LatitudeAccuracy`	Describes the degree of closeness of a measured quantity of latitude to its actual value in `AccuracyType`.
`unit`	Does not have any meaningful semantics in this description.
`maxValue`	Does not have any meaningful semantics in this description.
`minValue`	Does not have any meaningful semantics in this description.
`offset`	Describes the value added to a base value of longitude in order to get to a specific absolute value.

IECNORM.COM : Click to view the full PDF of ISO/IEC 23005-2:2013

© ISO/IEC 2013 – All rights reserved

Name	*Definition*
VariousAccuracy	Describes the accuracy in various point of view. Each occurrence of this element defines one type of accuracy. This element defines the accuracy by using three attriubtes defined. The accuracyType attribute specifies the type of the accuracy by referencing the AccuracyTypeCS. The value attribute specifies the value to denote the accuracy. The unit attribute specifies the unit of the value attribute by referencing the UnitTypeCS.
crs	Specifies the URI of the coordinate reference system based on which the values of longitude, latitude and altitude are given. The default is urn:ogc:def:crs:EPSG::4326 specifying the Coordinate Reference System (CRS) with code 4326 specified in the EPSG database available at http://www.epsg.org/.
longitudeOffset	Describes the value added to a base value of longitude in order to get to a specific absolute value.
latitudeOffset	Describes the value added to a base value of latitude in order to get to a specific absolute value.
numOfLevels	Describes the number of value levels that the sensor can perceive in between maximum and minimum value of longitude. EXAMPLE The value 5 means the sensor can perceive 5 steps from minValue to maxValue.
sensitivity	Describes the minimum magnitude of input signal required to produce a specified output signal in given unit.
SNR	Describes the ratio of a signal power to the noise power corrupting the signal.
maxOperatingTemp	Describes the number of locations that a bend sensor can sense bending angles.
minOperatingTemp	Describes the distance between the adjacent sensing locations.

Semantics of the VariousAccuracyType

Name	*Definition*
VariousAccuracy	Tool for describing accuracy of the sensor in various point of view.
accuracyType	This attribute specifies the accuracy type, e.g., distance accuracy or reacquisition time, by referencing to the AccuracyTypeCS.
value	This attribute specifies the value of the accuracy.
accuracyUnit	This attribute specifies the unit of the accuracy description by referenceing to the UnitTypeCS.

IECNORM.COM : Click to view the full PDF of ISO/IEC 23005-2:2013

© ISO/IEC 2013 – All rights reserved

6.25.4 Examples

This example shows the description of a global position sensor's sensing capability with the following semantics. The sensor has an ID of “gps01” with the maximum operating temperature of 90 degrees Celsius, minimum operating temperature of -30 degrees Celsius, sensitivity of 0.01 degrees, and the position accuracy of 0.01 degree.

```
<cidl:SensorDeviceCapability   xsi:type="scdv:GlobalPositionSensorCapabilityType"
id="gps01"         crs="urn:ogc:def:crs:EPSG::4326"         maxOperatingTemp="90"
minOperatingTemp="-30" sensitivity="0.01">
   <scdv:VariousAccuracy       value="0.01"       accuracyType=":mpeg:mpeg-v:01-
AccuracyTypeCS-NS:PositionAccuracy"          accuracyUnit="urn:mpeg:mpeg-v:01-CI-
UnitTypeCS-NS:degree"/>
</cidl:SensorDeviceCapability>
```

6.26 Altitude sensor capability type

6.26.1 XML representation syntax

```
<!-- ################################################ -->
<!-- Altitude Sensor capability type                  -->
<!-- ################################################ -->
<complexType name="AltitudeSensorCapabilityType">
       <complexContent>
             <extension base="cidl:SensorCapabilityBaseType">
                <attribute name="crs" type="anyURI"
default="urn:ogc:def:crs:EPSG::4326"/>
             </extension>
      </complexContent>
</complexType>
```

6.26.2 Binary representation syntax

AltitudeSensorCapabilityType {	**(Number of bits)**	**(Mnemonic)**
SensoryDeviceCapabilityBase		SensoryDeviceCapabilityBaseType
crs		UTF-8
}		

6.26.3 Semantics

Semantics of the `AltitudeSensorCapabilityType`:

Name	*Definition*
`AltitudeSensorCapabilityType`	Tool for describing an altitude sensor capability.

IECNORM.COM : Click to view the full PDF of ISO/IEC 23005-2:2013

© ISO/IEC 2013 – All rights reserved

Name	*Definition*
crs	Specifies the URI of the coordinate reference system based on which the values of longitude, latitude and altitude are given. The default is urn:ogc:def:crs:EPSG::4326 specifying the Coordinate Reference System (CRS) with code 4326 specified in the EPSG database available at http://www.epsg.org/.
Accuracy	Describes the degree of closeness of a measured quantity to its actual value in AccuracyType.
unit	Specifies the unit of the sensor's measuring value as a reference to a classification scheme term provided by UnitTypeCS defined in A.2.1 of Part 6 of ISO/IEC 23005, if a unit other than the default unit specified in the semantics of the maxValue and minValue is used for the values of maxValue and minValue are used. The default unit is meter.
maxValue	Describes the maximum altitude that the altitude sensor can perceive in meters.
minValue	Describes the minimum altitude that the altitude sensor can perceive in meters.
offset	Describes the value needed to be added to a base value in order to get to a specific absolute value.
numOfLevels	Describes the number of altitude levels that the sensor can perceive in between maximum and minimum value. EXAMPLE The value 5 means the sensor can perceive 5 steps from minValue to maxValue.
sensitivity	Describes the minimum magnitude of input signal required to produce a specified output signal in given unit.
SNR	Describes the ratio of a signal power to the noise power corrupting the signal.

6.26.4 Examples

This example shows the description of a altitude sensing capability with the following semantics. The sensor has an ID of "ASID_01" and the maximum value shall be 1000 (meter) and the minimum value shall be 0 (meter) with the resolution of 2000 levels. The accuracy of the sensor is 0.5 (meter). The offset of sensor is 5 (meter).

```
<cidl:SensorDeviceCapability          xsi:type="scdv:AltitudeSensorCapabilityType"
id="ASID_01" minValue="0" maxValue="1000" numOfLevels="2000" offset="5" >
   <cidl:Accuracy xsi:type="cidl:ValueAccuracy" value="0.5"/>
</cidl:SensorDeviceCapability>
```

IECNORM.COM : Click to view the full PDF of ISO/IEC 23005-2:2013

© ISO/IEC 2013 – All rights reserved

6.27 Weather sensor capability type

6.27.1 XML representation syntax

```
<!-- ################################################ -->
<!-- Weather Sensor capability type                   -->
<!-- ################################################ -->
<complexType name="WeatherSensorCapabilityType">
   <complexContent>
      <extension base="cidl:SensorCapabilityBaseType">
         <sequence>
            <element name="TemperatureCapability"
type="scdv:TemperatureSensorCapabilityType" minOccurs="0"/>
            <element name="PrecipitationCapability" minOccurs="0">
               <complexType>
                  <complexContent>
                     <extension base="cidl:SensorCapabilityBaseType"/>
                  </complexContent>
               </complexType>
            </element>
            <element name="SnowCapability" minOccurs="0">
               <complexType>
                  <complexContent>
                     <extension base="cidl:SensorCapabilityBaseType"/>
                  </complexContent>
               </complexType>
            </element>
            <element name="WindCapability" minOccurs="0">
               <complexType>
                  <complexContent>
                     <extension base="cidl:SensorCapabilityBaseType"/>
                  </complexContent>
               </complexType>
            </element>
            <element name="HumidityCapability"
type="scdv:HumiditySensorCapabilityType" minOccurs="0"/>
         </sequence>
      </extension>
   </complexContent>
</complexType>
```

IECNORM.COM : Click to view the full PDF of ISO/IEC 23005-2:2013

6.27.2 Binary representation syntax

WeatherSensorCapabilityType {	**(Number of bits)**	**(Mnemonic)**
TemperatureCapabilityFlag	1	bslbf
PrecipitationCapabilityFlag	1	bslbf
SnowCapabilityFlag	1	bslbf
WindCapabilityFlag	1	bslbf
HumidityCapabilityFlag	1	bslbf
If (TemperatureCapabilityFlag) {		

© ISO/IEC 2013 – All rights reserved

WeatherSensorCapabilityType {	**(Number of bits)**	**(Mnemonic)**
TemperatureCapability		ensorCapabilityBaseType
}		
If (PrecipitationCapabilityFlag) {		
PrecipitationCapability		ensorCapabilityBaseType
}		
If (SnowCapabilityFlag) {		
SnowCapability		ensorCapabilityBaseType
}		
If (WindCapabilityFlag) {		
WindCapability		ensorCapabilityBaseType
}		
If (HumidityCapabilityFlag) {		
HumidityCapability		ensorCapabilityBaseType
}		
}		

6.27.3 Semantics

Semantics of the `WeatherSensorCapabilityType`:

Name	*Definition*
`WeatherSensorCapabilityType`	Tool for describing capabilities of a weather sensor, which may be either a physical sensor or a virtual sensor that can produce weather information or can gather weather information in various means.
`TemperatureCapabilityFlag`	This field, which is only present in the binary representation, signals the presence of the `TemperatureCapability` element. A value of ”1” means that this element is present and ”0” means that this element is not present.
`PrecipitationCapabilityFlag`	This field, which is only present in the binary representation, signals the presence of the `PrecipitationCapability` element. A value of ”1” means that this element is present and ”0” means that this element is not present.
`SnowCapabilityFlag`	This field, which is only present in the binary representation, signals the presence of the `SnowCapability` element. A value of ”1” means that this element is present and ”0” means that this element is not present.
`WindCapabilityFlag`	This field, which is only present in the binary representation, signals the

IECNORM.COM : Click to view the full PDF of ISO/IEC 23005-2:2013

© ISO/IEC 2013 – All rights reserved

Name	*Definition*
	presence of the `WindCapability` element. A value of ” 1” means that this element is present and ” 0” means that this element is not present.
`HumidityCapabilityFlag`	This field, which is only present in the binary representation, signals the presence of the `HumidityCapability` element. A value of ”1” means that this element is present and ”0” means that this element is not present.
`TemperatureCapability`	Element to describe the temperature-related capability of a weather sensor. If this element is not instantiated, the given Weather sensor is unable to provide temperature information.
`PrecipitationCapability`	Element to describe the precipitation-related capability of a weather sensor. If this element is not instantiated, the given Weather sensor is unable to provide precipitation information.
`SnowCapability`	Element to describe the snow-related capability of a weather sensor. If this element is not instantiated, the given Weather sensor is unable to provide snow information.
`WindCapability`	Element to describe the wind-related capability of a weather sensor. If this element is not instantiated, the given Weather sensor is unable to provide wind information.
`HumidityCapability`	Element to describe the humidity-related capability of a weather sensor. If this element is not instantiated, the given Weather sensor is unable to provide humidity information.
`sensorCapabilityBaseAttributes`	There are `sensorCapabilityBaseAttributes` inherited from the `SensorCapabilityBaseType` at the top level of the `WeatherSensorCapabilityType` as well as at each individual capability description of temperature, precipitation, snow, wind and humidity sensor. In this capability description, the attributes defined in the `sensorCapabilityBaseAttributes` of the top level are disabled and not used except the `id` and `sensorIdRef` attributes.

IECNORM.COM : Click to view the full PDF of ISO/IEC 23005-2:2013

6.27.4 Examples

The following is an example of the `WeatherSensorCapabilityType` to indicate that the capability of the given sensor. This example shows that the given Weather sensor with id of WSC_ID1 can sense humidity, temperature, and snow. The humidity information can be provided between 5% and 90% with sensitivity of 1%, the temperature information can be provided between 100 degrees Celsius and -100 degrees Celsius in 200 levels, and the snow information can be provided with maximum of 100 centimeters per minute, in 200 levels.

```
<cidl:SensorDeviceCapability xsi:type="scdv:WeatherSensorCapabilityType"
id="WSC_ID1">
   <scdv:TemperatureCapability maxValue="100" minValue="-100" numOfLevels="200"
unit="urn:mpeg:mpeg-v:01-CI-UnitTypeCS-NS:celsius"/>
   <scdv:SnowCapability maxValue="100" numOfLevels="200" unit="urn:mpeg:mpeg-
v:01-CI-UnitTypeCS-NS:centimeterperhour"/>
   <scdv:HumidityCapability maxValue="90" minValue="5" numOfLevels="90"
sensitivity="1"/>
</cidl:SensorDeviceCapability>
```

© ISO/IEC 2013 – All rights reserved

7 User's sensory preference vocabulary

7.1 Introduction

This Clause describes syntax and semantics of the user's sensory preference vocabulary to implement description of user's preference on individual sensory effect.

7.2 Schema wrapper conventions

The Syntax defined in this Clause assumes the following Schema Wrapper to form a valid XML schema document.

```
<schema xmlns="http://www.w3.org/2001/XMLSchema"
xmlns:mpeg7="urn:mpeg:mpeg7:schema:2004" xmlns:mpegvct="urn:mpeg:mpeg-v:2012:01-
CT-NS" xmlns:cidl="urn:mpeg:mpeg-v:2012:01-CIDL-NS" xmlns:sepv="urn:mpeg:mpeg-
v:2012:01-SEPV-NS" targetNamespace="urn:mpeg:mpeg-v:2012:01-SEPV-NS"
elementFormDefault="qualified" attributeFormDefault="unqualified"
version="ISO/IEC 23005-2" id="MPEG-V-SEPV.xsd">
   <import namespace="urn:mpeg:mpeg7:schema:2004"
schemaLocation="http://standards.iso.org/ittf/PubliclyAvailableStandards/MPEG-
7_schema_files/mpeg7-v2.xsd"/>
   <import namespace="urn:mpeg:mpeg-v:2012:01-CIDL-NS"
schemaLocation="CIDL.xsd"/>
   <import namespace="urn:mpeg:mpeg-v:2012:01-CT-NS" schemaLocation="MPEG-V-
CT.xsd"/>
```

Additionally, the following line should be appended to the resulting schema document in order to obtain a well-formed XML document.

```
</schema>
```

7.3 Light preference type

7.3.1 XML representation syntax

```
<!-- ################################################ -->
<!-- Light Preference type                            -->
<!-- ################################################ -->
<complexType name="LightPrefType">
   <complexContent>
      <extension base="cidl:UserSensoryPreferenceBaseType">
         <sequence>
            <element name="UnfavorableColor" type="mpegvct:colorType"
               minOccurs="0" maxOccurs="unbounded"/>
         </sequence>
         <attribute name="maxIntensity" type="float" use="optional"/>
         <attribute name="unit" type="mpegvct:unitType" use="optional"/>
      </extension>
   </complexContent>
</complexType>
```

IECNORM.COM : Click to view the full PDF of ISO/IEC 23005-2:2013

© ISO/IEC 2013 – All rights reserved

7.3.2 Binary representation syntax

LightPrefType {	(Number of bits)	(Mnemonic)
UnfavorableColorFlag	1	bslbf
maxIntensityFlag	1	bslbf
unitFlag	1	bslbf
UserSensoryPreferenceBase		UserSensoryPreferenceBaseType
if(UnfavorableColorFlag){		
LoopUnfavorableColor		vluimsbf5
for(k=0;k< LoopUnfavorableColor;k++){		
UnfavorableColor[k]		ColorType
}		
}		
if(maxIntensityFlag){		
maxIntensity	32	fsbf
}		
if(unitFlag){		
Unit	8	bslbf
}		
}		

7.3.3 Semantics

Semantics of the `LightPrefType` type:

Name	*Definition*
`LightPrefType`	Tool for describing a user preference on light effect.
`UnfavorableColorFlag`	This field, which is only present in the binary representation, signals the presence of the activation attribute. A value of ”1” means the attribute shall be used and ”0” means the attribute shall not be used.
`maxIntensityFlag`	This field, which is only present in the binary representation, signals the presence of the activation attribute. A value of ”1” means the attribute shall be used and ”0” means the attribute shall not be used.

IECNORM.COM : Click to view the full PDF of ISO/IEC 23005-2:2013

© ISO/IEC 2013 – All rights reserved

Name	*Definition*
`unitFlag`	This field, which is only present in the binary representation, signals the presence of the activation attribute. A value of ”1” means the attribute shall be used and ”0” means the attribute shall not be used.
`maxIntensity`	Describes the maximum desirable intensity of the light effect in terms of illumination with respect to [10^{-5} lux, 130 klux].
`unit`	Specifies the unit of the `maxIntensity` value as a reference to a classification scheme term provided by UnitTypeCS defined in A.2.1 of ISO/IEC 23005-6, if a unit other than the default unit specified in the semantics of the `maxIntensity` is used. The reference to the classification scheme shall be done using the `mpeg7:termReferenceType` defined in 7.6 of ISO/IEC 15938-5:2003.
`UnfavorableColor`	Describes the list of user’s detestable colors either as a reference to a classification scheme term or as RGB value. A CS that may be used for this purpose is the ColorCS defined in A.2.2 of ISO/IEC 23005-6. The reference to the classification scheme shall be done using the `mpeg7:termReferenceType` defined in 7.6 of ISO/IEC 15938-5:2003. EXAMPLE `urn:mpeg:mpeg-v:01-SI-ColorCS-NS:alice_blue` would describe the color Alice blue.

7.3.4 Examples

This example shows the description of a user preference on light effect with the following semantics. The light effect is desired with the maximum intensity of 300 lux. A color, which is refused by user, is “alice_blue” from the classification scheme described in A2.2 of ISO/IEC 23005-6.

```
<cidl:USPreference xsi:type="sepv:LightPrefType" activate="true"
unit="urn:mpeg:mpeg-v:01-CI-UnitTypeCS-NS:lux" maxIntensity="300">
   <sepv:UnfavorableColor>
   :mpeg:mpeg-v:01-SI-ColorCS-NS:alice_blue
   </sepv:UnfavorableColor>
</cidl:USPreference>
```

7.4 Flash preference type

7.4.1 XML representation syntax

```
<!-- ################################################ -->
<!--  Flash Preference type                           -->
<!-- ################################################ -->
<complexType name="FlashPrefType">
   <complexContent>
      <extension base="sepv:LightPrefType">
         <attribute name="maxFrequency" type="float" use="optional"/>
         <attribute name="freqUnit" type="mpegvct:unitType" use="optional"/>
      </extension>
   </complexContent>
</complexType>
```

IECNORM.COM : Click to view the full PDF of ISO/IEC 23005-2:2013

© ISO/IEC 2013 – All rights reserved

7.4.2 Binary representation syntax

FlashPrefType {	(Number of bits)	(Mnemonic)
maxFrequencyFlag	1	bslbf
freqUnitFlag	1	bslbf
LightPref		LightPrefType
if(maxFrequencyFlag){		
maxFrequency	32	fsbf
}		
if(freqUnitFlag){		
freqUnit	8	bslbf
}		
}		

7.4.3 Semantics

Semantics of the `FlashPrefType` type:

Name	*Definition*
`FlashPrefType`	Tool for describing a user preference on flash effect. It is extended from the light type.
`maxFrequencyFlag`	This field, which is only present in the binary representation, signals the presence of the activation attribute. A value of ”1” means the attribute shall be used and ”0” means the attribute shall not be used.
`freqUnitFlag`	This field, which is only present in the binary representation, signals the presence of the activation attribute. A value of ”1” means the attribute shall be used and ”0” means the attribute shall not be used.
`maxFrequency`	Describes the maximum allowed number of flickering in times per second. EXAMPLE The value 10 means it will flicker 10 times for each second.
`freqUnit`	Specifies the unit of the `maxFrequency` value as a reference to a classification scheme term provided by UnitTypeCS defined in A.2.1 of ISO/IEC 23005-6, if a unit other than the default unit specified in the semantics of the `maxFrequency` is used. The reference to the classification scheme shall be done using the `mpeg7:termReferenceType` defined in 7.6 of ISO/IEC 15938-5:2003.

IECNORM.COM : Click to view the full PDF of ISO/IEC 23005-2:2013

© ISO/IEC 2013 – All rights reserved

7.4.4 Examples

This example shows the description of a user preference on flash effect with the following semantics. The flash is desired with the maximum frequency of 50 times per second.

```
<cidl:USPreference xsi:type="sepv:FlashPrefType" activate="true"
maxFrequency="50" unit="urn:mpeg:mpeg-v:01-CI-UnitTypeCS-NS:Hertz"/>
```

7.5 Heating preference type

7.5.1 XML representation syntax

```
<!-- ################################################ -->
<!-- Heating Preference type                          -->
<!-- ################################################ -->
<complexType name="HeatingPrefType">
    <complexContent>
        <extension base="cidl:UserSensoryPreferenceBaseType">
            <attribute name="minIntensity" type="integer" use="optional"/>
            <attribute name="maxIntensity" type="integer" use="optional"/>
            <attribute name="unit" type="mpegvct:unitType" use="optional"/>
        </extension>
    </complexContent>
</complexType>
```

7.5.2 Binary representation syntax

HeatingPrefType {	**(Number of bits)**	**(Mnemonic)**
minIntensityFlag	1	bslbf
maxIntensityFlag	1	bslbf
unitFlag	1	bslbf
UserSensoryPreferenceBase		UserSensoryPreferenceBaseType
if(minIntensityFlag){		
minIntensity	8	uimsbf
}		
if(maxIntensityFlag){		
maxIntensity	16	uimsbf
}		
if(unitFlag){		
unit	8	bslbf
}		
}		

IECNORM.COM : Click to view the full PDF of ISO/IEC 23005-2:2013

© ISO/IEC 2013 – All rights reserved

7.5.3 Semantics

Semantics of the `HeatingPrefType` type:

Name	*Definition*
`HeatingPrefType`	Tool for describing a user preference on heating effect.
`minIntensityFlag`	This field, which is only present in the binary representation, signals the presence of the activation attribute. A value of "1" means the attribute shall be used and "0" means the attribute shall not be used.
`maxIntensityFlag`	This field, which is only present in the binary representation, signals the presence of the activation attribute. A value of "1" means the attribute shall be used and "0" means the attribute shall not be used.
`unitFlag`	This field, which is only present in the binary representation, signals the presence of the activation attribute. A value of "1" means the attribute shall be used and "0" means the attribute shall not be used.
`maxIntensity`	Describes the highest desirable temperature of the heating effect with respect to the Celsius scale (or Fahrenheit).
`minIntensity`	Describes the lowest desirable temperature of the heating effect with respect to the Celsius scale (or Fahrenheit).
`unit`	Specifies the unit of the `maxIntensity` and `minIntensity` value as a reference to a classification scheme term provided by UnitTypeCS defined in A.2.1 of ISO/IEC 23005-6. The reference to the classification scheme shall be done using the `mpeg7:termReferenceType` defined in 7.6 of ISO/IEC 15938-5:2003.

7.5.4 Examples

This example shows a description of a user preference on heating effect with the following semantics. The identifier for this preference description is "heater001". The heating is desired with the maximum intensity of upto 50 degrees Celsius, and minimum intensity of 20 degrees Celsius. When the given command on the heating effect is not within the range of preference or capability, it should be properly scaled.

```
<cidl:USPreference xsi:type="sepv:HeatingPrefType" id="heater001"
maxIntensity="50" minIntensity="20" adaptationMode="scalable"
activate="true"/>
```

IECNORM.COM : Click to view the full PDF of ISO/IEC 23005-2:2013

7.6 Cooling preference type

7.6.1 XML representation syntax

```
<!-- ################################################ -->
<!-- Cooling Preference type                          -->
<!-- ################################################ -->
<complexType name="CoolingPrefType">
   <complexContent>
      <extension base="cidl:UserSensoryPreferenceBaseType">
         <attribute name="minIntensity" type="integer" use="optional"/>
         <attribute name="maxIntensity" type="integer" use="optional"/>
```

© ISO/IEC 2013 – All rights reserved

```
        <attribute name="unit" type="mpegvct:unitType" use="optional"/>
      </extension>
    </complexContent>
</complexType>
```

7.6.2 Binary representation syntax

CoolingPrefType {	(Number of bits)	(Mnemonic)
minIntensityFlag	1	bslbf
maxIntensityFlag	1	bslbf
unitFlag	1	bslbf
UserSensoryPreferenceBase		UserSensoryPreferenceBaseType
if(minIntensityFlag){		
minIntensity	16	simsbf
}		
if(maxIntensityFlag){		
maxIntensity	16	simsbf
}		
if(unitFlag){		
unit	8	bslbf
}		
}		

IECNORM.COM : Click to view the full PDF of ISO/IEC 23005-2:2013

7.6.3 Semantics

Semantics of the `CoolingPrefType` type:

Name	*Definition*
`CoolingPrefType`	Tool for describing a user preference on cooling effect.
`minIntensityFlag`	This field, which is only present in the binary representation, signals the presence of the activation attribute. A value of ”1” means the attribute shall be used and ”0” means the attribute shall not be used.
`maxIntensityFlag`	This field, which is only present in the binary representation, signals the presence of the activation attribute. A value of ”1” means the attribute shall be used and ”0” means the attribute shall not be used.

© ISO/IEC 2013 – All rights reserved

Name	*Definition*
`unitFlag`	This field, which is only present in the binary representation, signals the presence of the activation attribute. A value of ”1” means the attribute shall be used and ”0” means the attribute shall not be used.
`maxIntensity`	Describes the lowest desirable temperature of the cooling effect with respect to the Celsius scale (or Fahrenheit).
`minIntensity`	Describes the highest desirable temperature of the cooling effect with respect to the Celsius scale (or Fahrenheit).
`unit`	Specifies the unit of the `maxIntensity` and `minIntensity` value as a reference to a classification scheme term provided by UnitTypeCS defined in A.2.1 of ISO/IEC 23005-6. The reference to the classification scheme shall be done using the `mpeg7:termReferenceType` defined in 7.6 of ISO/IEC 15938-5:2003.

7.6.4 Examples

This example shows a description of a user preference on cooling effect with the following semantics. The identifier for this preference description is “cooling001”. The cooling is desired with the maximum intensity of upto 10 degrees Celsius, and minimum intensity of 30 degrees Celsius. When the given command on the cooling effect is not within the range of preference or capability, it should be properly scaled.

```
<cidl:USPreference xsi:type="sepv:CoolingPrefType" id="cooling001"
maxIntensity="10" minIntensity="30" adaptationMode="scalable"
activate="true"/>
```

7.7 Wind preference type

7.7.1 XML representation syntax

```
<!-- ################################################ -->
<!-- Wind Preference type                             -->
<!-- ################################################ -->
<complexType name="WindPrefType">
   <complexContent>
      <extension base="cidl:UserSensoryPreferenceBaseType">
         <attribute name="maxIntensity" type="integer" use="optional"/>
         <attribute name="unit" type="mpegvct:unitType" use="optional"/>
      </extension>
   </complexContent>
</complexType>
```

7.7.2 Binary representation syntax

WindPrefType {	**(Number of bits)**	**(Mnemonic)**
maxIntensityFlag	1	bslbf
unitFlag	1	bslbf

IECNORM.COM : Click to view the full PDF of ISO/IEC 23005-2:2013

© ISO/IEC 2013 – All rights reserved

WindPrefType {	**(Number of bits)**	**(Mnemonic)**
UserSensoryPreferenceBase		UserSensoryPreferenceBaseType
if(maxIntensityFlag){		
maxIntensity	16	simsbf
}		
if(unitFlag){		
unit	8	bslbf
}		
}		

7.7.3 Semantics

Semantics of the `WindPrefType` type:

Name	*Definition*
`WindPrefType`	Tool for describing a user preference on a wind effect.
`maxIntensityFlag`	This field, which is only present in the binary representation, signals the presence of the activation attribute. A value of ”1” means the attribute shall be used and ”0” means the attribute shall not be used.
`unitFlag`	This field, which is only present in the binary representation, signals the presence of the activation attribute. A value of ”1” means the attribute shall be used and ”0” means the attribute shall not be used.
`maxIntensity`	Describes the maximum desirable intensity of the wind effect in terms of strength with respect to the Beaufort scale.
`unit`	Specifies the unit of the `maxIntensity` value as a reference to a classification scheme term provided by UnitTypeCS defined in A.2.1 of ISO/IEC 23005-6, if a unit other than the default unit specified in the semantics of the `maxIntensity` is used. The reference to the classification scheme shall be done using the `mpeg7:termReferenceType` defined in 7.6 of ISO/IEC 15938-5:2003.

IECNORM.COM : Click to view the full PDF of ISO/IEC 23005-2:2013

7.7.4 Examples

This example shows a description of a user preference on wind effect with the following semantics. The identifier for this preference description is “wind01”. The wind is desired with the maximum intensity of upto 4 Beaufort. When the given command on the wind effect is not within the range of preference or capability, it should be clipped.

<cidl:USPreference xsi:type="sepv:WindPrefType" id="wind01" maxIntensity="4" activate="true" adaptationMode="strict"/>

© ISO/IEC 2013 – All rights reserved

7.8 Vibration preference type

7.8.1 XML representation syntax

```
<!-- ################################################ -->
<!--  Vibration Preference type                       -->
<!-- ################################################ -->
<complexType name="VibrationPrefType">
   <complexContent>
      <extension base="cidl:UserSensoryPreferenceBaseType">
         <attribute name="maxIntensity" type="integer" use="optional"/>
         <attribute name="unit" type="mpegvct:unitType" use="optional"/>
      </extension>
   </complexContent>
</complexType>
```

7.8.2 Binary representation syntax

VibrationPrefType {	**(Number of bits)**	**(Mnemonic)**
maxIntensityFlag	1	bslbf
unitFlag	1	bslbf
UserSensoryPreferenceBase		UserSensoryPreferenceBaseType
if(maxIntensityFlag){		
maxIntensity	16	simsbf
}		
if(unitFlag){		
unit	8	bslbf
}		
}		

IECNORM.COM : Click to view the full PDF of ISO/IEC 23005-2:2013

7.8.3 Semantics

Semantics of the `VibrationPrefType` type:

Name	*Definition*
`VibrationPrefType`	Tool for describing a user preference on vibration effect.
`maxIntensityFlag`	This field, which is only present in the binary representation, signals the presence of the activation attribute. A value of ”1” means the attribute shall be used and ”0” means the attribute shall not be used.

© ISO/IEC 2013 – All rights reserved

Name	*Definition*
`unitFlag`	This field, which is only present in the binary representation, signals the presence of the activation attribute. A value of ”1” means the attribute shall be used and ”0” means the attribute shall not be used.
`maxIntensity`	Describes the maximum desirable intensity of the vibration effect in terms of strength with respect to Hertz.
`unit`	Specifies the unit of the `maxIntensity` value as a reference to a classification scheme term provided by UnitTypeCS defined in A.2.1 of ISO/IEC 23005-6, if a unit other than the default unit specified in the semantics of the `maxIntensity` is used. The reference to the classification scheme shall be done using the `mpeg7:termReferenceType` defined in 7.6 of ISO/IEC 15938-5:2003.

7.8.4 Examples

This example shows a description of a user preference on vibration effect with the following semantics. The identifier for this preference description is “vibe02”. The vibration is desired with the maximum intensity of upto 600 Hz. When the given command on the vibration effect is not within the range of preference or capability, it should be properly scaled with the maximum of 600 Hz, if the maximum intensity defined in the device capability is greater than 600.

```
<cidl:USPreference xsi:type="sepv:VibrationPrefType" id="vibe02"
maxIntensity="600" activate="true" adaptationMode="scalable"/>
```

7.9 Scent preference type

7.9.1 XML representation syntax

```
<!-- ################################################ -->
<!--  Scent Preference type                           -->
<!-- ################################################ -->
<complexType name="ScentPrefType">
   <complexContent>
      <extension base="cidl:UserSensoryPreferenceBaseType">
         <sequence>
            <element name="HedonicScent" type="mpeg7:termReferenceType"
               minOccurs="0" maxOccurs="unbounded"/>
         </sequence>
         <attribute name="maxIntensity" type="integer" use="optional"/>
         <attribute name="unit" type="mpegvct:unitType" use="optional"/>
      </extension>
   </complexContent>
</complexType>
```

IECNORM.COM : Click to view the full PDF of ISO/IEC 23005-2:2013

© ISO/IEC 2013 – All rights reserved

7.9.2 Binary representation syntax

ScentPrefType {	(Number of bits)	(Mnemonic)
HedonicScentFlag	1	bslbf
maxIntensityFlag	1	bslbf
unitFlag	1	bslbf
UserSensoryPreferenceBase		UserSensoryPreferenceBaseType
if(HedonicScentFlag){		
LoopHedonicScent		vluimsbf5
for(k=0;k< LoopHedonicScent;k++){		
HedonicScent[k]	8	bslbf
}		
}		
if(maxIntensityFlag){		
maxIntensity	16	simsbf
}		
if(unitFlag){		
unit	8	bslbf
}		
}		

IECNORM.COM : Click to view the full PDF of ISO/IEC 23005-2:2013

7.9.3 Semantics

Semantics of the `ScentPrefType` type:

Name	*Definition*
`ScentPrefType`	Tool for describing a user preference on scent effect.
`HedonicScentFlag`	This field, which is only present in the binary representation, signals the presence of the activation attribute. A value of ”1” means the attribute shall be used and ”0” means the attribute shall not be used.
`maxIntensityFlag`	This field, which is only present in the binary representation, signals the presence of the activation attribute. A value of ”1” means the attribute shall be used and ”0” means the attribute shall not be used.

© ISO/IEC 2013 – All rights reserved

Name	*Definition*
`unitFlag`	This field, which is only present in the binary representation, signals the presence of the activation attribute. A value of ”1” means the attribute shall be used and ”0” means the attribute shall not be used.
`LoopHedonicScent`	This field, which is only present in the binary representation, specifies the number of HedonicScent contained in the description.
`HedonicScent`	Describes the list of user’s pleasant or unpleasant scent. A CS that may be used for this purpose is the `ScentCS` defined in A.2.4 of ISO/IEC 23005-6. The reference to the classification scheme shall be done using the `mpeg7:termReferenceType` defined in 7.6 of ISO/IEC 15938-5:2003.
`maxIntensity`	Describes the maximum desirable intensity of the scent effect in terms of milliliter/hour.
`unit`	Specifies the unit of the `maxIntensity` value as a reference to a classification scheme term provided by UnitTypeCS defined in A.2.1 of ISO/IEC 23005-6, if a unit other than the default unit specified in the semantics of the `maxIntensity` is used. The reference to the classification scheme shall be done using the `mpeg7:termReferenceType` defined in 7.6 of ISO/IEC 15938-5:2003.

7.9.4 Examples

This example shows a description of a user preference on scent effect with the following semantics. The identifier for this preference description is “scent001”. The scent effect is desired with the maximum intensity of upto 4 milliliter/hour. When the given command on the scent effect is not within the range of preference or capability, it should be properly scaled with the maximum of 4 milliliter/hour, if the maximum intensity defined in the device capability is greater than 4. Also, it specifies that the scent of rose as defined in ScentCS of ISO/IEC 23005-6 is not desired.

```
<cidl:USPreference xsi:type="sepv:ScentPrefType" id="scent001"
maxIntensity="4" adaptationMode="scalable">
  <sepv:HedonicScent>
  :mpeg:mpeg-v:01-SI-ScentCS-NS:rose
  </sepv:HedonicScent>
</cidl:USPreference>
```

7.10 Fog preference type

7.10.1 XML representation syntax

```
<!-- ################################################ -->
<!--  Fog Preference type                             -->
<!-- ################################################ -->
<complexType name="FogPrefType">
   <complexContent>
      <extension base="cidl:UserSensoryPreferenceBaseType">
         <attribute name="maxIntensity" type="integer" use="optional"/>
         <attribute name="unit" type="mpegvct:unitType" use="optional"/>
      </extension>
   </complexContent>
</complexType>
```

IECNORM.COM : Click to view the full PDF of ISO/IEC 23005-2:2013

© ISO/IEC 2013 – All rights reserved

7.10.2 Binary representation syntax

FogPrefType {	(Number of bits)	(Mnemonic)
maxIntensityFlag	1	bslbf
unitFlag	1	bslbf
UserSensoryPreferenceBase		UserSensoryPreferenceBaseType
if(maxIntensityFlag){		
maxIntensity	16	simsbf
}		
if(unitFlag){		
unit	8	bslbf
}		
}		

7.10.3 Semantics

Semantics of the `FogPrefType` type:

Name	*Definition*
`FogPrefType`	Tool for describing a preference on fog effect.
`maxIntensityFlag`	This field, which is only present in the binary representation, signals the presence of the activation attribute. A value of "1" means the attribute shall be used and "0" means the attribute shall not be used.
`unitFlag`	This field, which is only present in the binary representation, signals the presence of the activation attribute. A value of "1" means the attribute shall be used and "0" means the attribute shall not be used.
`maxIntensity`	Describes the maximum desirable intensity of the fog effect in terms of milliliter/hour.
`unit`	Specifies the unit of the `maxIntensity` value as a reference to a classification scheme term provided by UnitTypeCS defined in A.2.1 of ISO/IEC 23005-6, if a unit other than the default unit specified in the semantics of the `maxIntensity` is used. The reference to the classification scheme shall be done using the `mpeg7:termReferenceType` defined in 7.6 of ISO/IEC 15938-5:2003.

IECNORM.COM : Click to view the full PDF of ISO/IEC 23005-2:2013

© ISO/IEC 2013 – All rights reserved

7.10.4 Examples

This example shows a description of a user preference on fog effect with the following semantics. The identifier for this preference description is “fogfog”. The fog effect is desired with the maximum intensity of upto 5 milliliter/hour. When the given command on the fog effect is not within the range of preference or capability, it should be properly scaled with the maximum of 5 milliliter/hour, if the maximum intensity defined in the device capability is greater than 5.

```
<cidl:USPreference xsi:type="sepv:FogPrefType" id="fogfog" maxIntensity="5"
adaptationMode="scalable"/>
```

7.11 Spraying preference type

7.11.1 XML representation syntax

```
<!-- ################################################ -->
<!--  Spraying Preference type                        -->
<!-- ################################################ -->
<complexType name="SprayingPrefType">
   <complexContent>
      <extension base="cidl:UserSensoryPreferenceBaseType">
         <attribute name="sprayingType" type="mpeg7:termReferenceType"/>
         <attribute name="maxIntensity" type="integer" use="optional"/>
         <attribute name="unit" type="mpegvct:unitType" use="optional"/>
      </extension>
   </complexContent>
</complexType>
```

7.11.2 Binary representation syntax

SprayingPrefType{	**(Number of bits)**	**(Mnemonic)**
sprayingFlag	1	bslbf
maxIntensityFlag	1	bslbf
unitFlag	1	bslbf
UserSensoryPreferenceBase		UserSensoryPreferenceBaseType
if(sprayingFlag){		
spraying		SprayingType
}		
if(maxIntensityFlag){		
maxIntensity	16	simsbf
}		
if(unitFlag){		

IECNORM.COM : Click to view the full PDF of ISO/IEC 23005-2:2013

© ISO/IEC 2013 – All rights reserved

SprayingPrefType{	**(Number of bits)**	**(Mnemonic)**
unit	8	bslbf
}		
}		

7.11.3 Semantics

Semantics of the `SprayingPrefType` type:

Name	*Definition*
`SprayingPrefType`	Tool for describing a user preference on spraying effect.
`sprayingFlag`	This field, which is only present in the binary representation, signals the presence of the activation attribute. A value of "1" means the attribute shall be used and "0" means the attribute shall not be used.
`maxIntensityFlag`	This field, which is only present in the binary representation, signals the presence of the activation attribute. A value of "1" means the attribute shall be used and "0" means the attribute shall not be used.
`unitFlag`	This field, which is only present in the binary representation, signals the presence of the activation attribute. A value of "1" means the attribute shall be used and "0" means the attribute shall not be used.
`sprayingType`	Describes the type of the sprayed material as a reference to a classification scheme term. The reference to the classification scheme shall be done using the `mpeg7:termReferenceType` defined in 7.6 of ISO/IEC 15938-5:2003. A CS that may be used for this purpose is the `SprayingTypeCS` defined in Annex A.2.7 of ISO/IEC 23005-6.
`maxIntensity`	Describes the maximum desirable intensity of the spraying effect in terms of milliliter/hour.
`unit`	Specifies the unit of the `maxIntensity` value as a reference to a classification scheme term provided by UnitTypeCS defined in A.2.1 of ISO/IEC 23005-6, if a unit other than the default unit specified in the semantics of the `maxIntensity` is used. The reference to the classification scheme shall be done using the `mpeg7:termReferenceType` defined in 7.6 of ISO/IEC 15938-5:2003.

IECNORM.COM : Click to view the full PDF of ISO/IEC 23005-2:2013

7.11.4 Examples

This example shows a description of a user preference on spraying effect with the following semantics. The identifier for this preference description is "letspray". The spraying effect is desired with the maximum intensity of upto 4 milliliter/hour. When the given command on the spraying effect is not within the range of preference or capability, it should be properly scaled with the maximum of 4 milliliter/hour, if the maximum intensity defined in the device capability is greater than 4. The desired material to be sprayed is purified water, as defined in the SprayingTypeCS defined in Annex A.2.7 of ISO/IEC 23005-6.

© ISO/IEC 2013 – All rights reserved

```
<cidl:USPreference xsi:type="sepv:SprayingPrefType" id="letspray"
maxIntensity="4" sprayingType="urn:mpeg:mpeg-v:01-SI-SprayingTypeCS-
NS:water"/>
```

7.12 Color correction preference type

7.12.1 XML representation syntax

```
<!-- ################################################ -->
<!-- Color Correction Preference Type                 -->
<!-- ################################################ -->
<complexType name="ColorCorrectionPrefType">
   <complexContent>
      <extension base="cidl:UserSensoryPreferenceBaseType"/>
   </complexContent>
</complexType>
```

7.12.2 Binary representation syntax

ColorCorrectionPrefType {	**(Number of bits)**	**(Mnemonic)**
UserSensoryPreferenceBase		UserSensoryPreferenceBaseType
}		

7.12.3 Semantics

Semantics of the `ColorCorrectionPreferenceType` type:

Name	*Definition*
`ColorCorrectionPrefType`	Specifies whether the user prefers to use color correction functionality of the device or not by using `activate` attribute. Any information given by other attributes is ignored.

7.12.4 Examples

This example shows the description of a user preference on color correction effect with the following semantics. The color collection effect is desired by user simply by activating it “true”.

```
<cidl:USPreference xsi:type="sepv:ColorCorrectionPrefType" activate="true"/>
```

IECNORM.COM : Click to view the full PDF of ISO/IEC 23005-2:2013

© ISO/IEC 2013 – All rights reserved

7.13 Tactile preference type

7.13.1 XML representation syntax

```
<!-- ################################################ -->
<!-- Tactile Preference type                          -->
<!-- ################################################ -->
<complexType name="TactilePrefType">
   <complexContent>
      <extension base="cidl:UserSensoryPreferenceBaseType">
         <attribute name="maxTemperature" type="float" use="optional"/>
         <attribute name="minTemperature" type="float" use="optional"/>
         <attribute name="maxCurrent" type="float" use="optional"/>
         <attribute name="maxVibration" type="float" use="optional"/>
         <attribute name="tempUnit" type="mpegvct:unitType" use="optional"/>
         <attribute name="currentUnit" type="mpegvct:unitType" use="optional"/>
         <attribute name="vibrationUnit" type="mpegvct:unitType"
            use="optional"/>
      </extension>
   </complexContent>
</complexType>
```

7.13.2 Binary representation syntax

TactilePrefType {	(Number of bits)	(Mnemonic)
maxTemperatureFlag	1	bslbf
minTemperatureFlag	1	bslbf
maxCurrentFlag	1	bslbf
maxVibrationFlag	1	bslbf
tempUnitFlag	1	bslbf
currentUnitFlag	1	bslbf
vibrationUnitFlag	1	bslbf
UserSensoryPreferenceBase		UserSensoryPreferenceBaseType
if(maxTemperatureFlag){		
maxTemperature	32	fsbf
}		
if(minTemperatureFlag){		
minTemperature	32	fsbf
}		
if(maxCurrentFlag){		

IECNORM.COM : Click to view the full PDF of ISO/IEC 23005-2:2013

© ISO/IEC 2013 – All rights reserved

TactilePrefType {	**(Number of bits)**	**(Mnemonic)**
maxCurrent	32	fsbf
}		
if(maxVibrationFlag){		
maxVibration	32	fsbf
}		
if(tempUnitFlag){		
tempUnit	8	bslbf
}		
if(currentUnitFlag){		
currentUnit	8	bslbf
}		
if(vibrationUnitFlag){		
vibrationUnit	8	bslbf
}		
}		

7.13.3 Semantics

Semantics of the `TactilePrefType`:

Name	*Definition*
`TactilePrefType`	Tool for describing a user preference on tactile effect.
`maxTemperatureFlag`	This field, which is only present in the binary representation, signals the presence of the activation attribute. A value of ”1” means the attribute shall be used and ”0” means the attribute shall not be used.
`minTemperatureFlag`	This field, which is only present in the binary representation, signals the presence of the activation attribute. A value of ”1” means the attribute shall be used and ”0” means the attribute shall not be used.
`maxCurrentFlag`	This field, which is only present in the binary representation, signals the presence of the activation attribute. A value of ”1” means the attribute shall be used and ”0” means the attribute shall not be used.
`maxVibrationFlag`	This field, which is only present in the binary representation, signals the presence of the activation attribute. A value of ”1” means the attribute shall be used and ”0” means the attribute shall not be used.

IECNORM.COM : Click to view the full PDF of ISO/IEC 23005-2:2013

© ISO/IEC 2013 – All rights reserved

Name	*Definition*
tempUnitFlag	This field, which is only present in the binary representation, signals the presence of the activation attribute. A value of ”1” means the attribute shall be used and ”0” means the attribute shall not be used.
currentUnitFlag	This field, which is only present in the binary representation, signals the presence of the activation attribute. A value of ”1” means the attribute shall be used and ”0” means the attribute shall not be used.
vibrationUnitFlag	This field, which is only present in the binary representation, signals the presence of the activation attribute. A value of ”1” means the attribute shall be used and ”0” means the attribute shall not be used.
maxTemperature	Describes the maximum desirable temperature regarding how hot the tactile effect may be achieved. (Celsius)
minTemperature	Describes the minimum desirable temperature regarding how cold the tactile effect may be achieved.(Celsius)
maxCurrent	Describes the maximum desirable electric current. (mA)
maxVibration	Describes the maximum desirable vibration.(mm)
tempUnit	Specifies the unit of the intensity, as a reference to a classification scheme term provided by UnitTypeCS defined in A.2.1 of ISO/IEC 23005-6. If the unit is not specified, the default unit is Celsius. The reference to the classification scheme shall be done using the mpeg7:termReferenceType defined in 7.6 of ISO/IEC 15938-5:2003.
currentUnit	Specifies the unit of the intensity, as a reference to a classification scheme term provided by UnitTypeCS defined in A.2.1 of ISO/IEC 23005-6. If the unit is not specified, the default unit is milli-ampere. The reference to the classification scheme shall be done using the mpeg7:termReferenceType defined in 7.6 of ISO/IEC 15938-5:2003.
vibrationUnit	Specifies the unit of the intensity, as a reference to a classification scheme term provided by UnitTypeCS defined in A.2.1 of ISO/IEC 23005-6. The reference to the classification scheme shall be done using the mpeg7:termReferenceType defined in 7.6 of ISO/IEC 15938-5:2003.

IECNORM.COM : Click to view the full PDF of ISO/IEC 23005-2:2013

7.13.4 Examples

An example of the TactilePrefType to indicate the preference of tactile sensory effect is given. For the case of thermal display maximum temperature is 45 degree in Celsius and minimum temperature is 10 degree in Censius. Also maximum electric current less than 30mA is preferred and maximum vibration not exceeded 0.1millimeter is preferred.

```
<cidl:USPreference xsi:type="sepv:TactilePrefType" maxTemperature="45"
minTemperature="10" maxCurrent="30" maxVibration="0.1"
tempUnit="urn:mpeg:mpeg-v:01-CI-UnitTypeCS-NS:celsius"
currentUnit="urn:mpeg:mpeg-v:01-CI-UnitTypeCS-NS:milliampere"
vibrationUnit="urn:mpeg:mpeg-v:01-CI-UnitTypeCS-NS:millimeter"/>
```

© ISO/IEC 2013 – All rights reserved

7.14 Kinesthetic preference type

7.14.1 XML representation syntax

```
<!-- ################################################ -->
<!-- Kinesthetic Preference type                      -->
<!-- ################################################ -->
<complexType name="KinestheticPrefType">
   <complexContent>
      <extension base="cidl:UserSensoryPreferenceBaseType">
         <sequence>
            <element name="MaxForce" type="mpegvct:Float3DVectorType"
               minOccurs="0"/>
            <element name="MaxTorque" type="mpegvct:Float3DVectorType"
               minOccurs="0"/>
         </sequence>
         <attribute name="forceUnit" type="mpegvct:unitType" use="optional"/>
         <attribute name="torqueUnit" type="mpegvct:unitType" use="optional"/>
      </extension>
   </complexContent>
</complexType>
```

7.14.2 Binary representation syntax

KinestheticPrefType {	**(Number of bits)**	**(Mnemonic)**
maxForceFlag	1	bslbf
maxTorqueFlag	1	bslbf
forceUnitFlag	1	bslbf
torqueUnitFlag	1	bslbf
UserSensoryPreferenceBase		UserSensoryPreferenceBaseType
if(maxForceFlag){		
maxForce		Float3DVectorType
}		
if(maxTorqueFlag){		
maxTorque		Float3DVectorType
}		
if(forceUnitFlag) {		
forceUnit	8	bslbf
}		
if(torqueUnitFlag) {		

IECNORM.COM : Click to view the full PDF of ISO/IEC 23005-2:2013

© ISO/IEC 2013 – All rights reserved

KinestheticPrefType {	**(Number of bits)**	**(Mnemonic)**
torqueUnit	8	bslbf
}		
}		
Float3DVectorType {		
X	32	fsbf
Y	32	fsbf
Z	32	fsbf
}		

7.14.3 Semantics

Semantics of the `KinestheticPrefType`:

Name	*Definition*
`KinestheticPrefType`	Tool for describing a user preference on Kinesthetic effect (forcefeedback effect).
`maxForceFlag`	This field, which is only present in the binary representation, signals the presence of the activation attribute. A value of ”1” means the attribute shall be used and ”0” means the attribute shall not be used.
`maxTorqueFlag`	This field, which is only present in the binary representation, signals the presence of the activation attribute. A value of ”1” means the attribute shall be used and ”0” means the attribute shall not be used.
`forceUnitFlag`	This field, which is only present in the binary representation, signals the presence of the activation attribute. A value of ”1” means the attribute shall be used and ”0” means the attribute shall not be used.
`torqueUnitFlag`	This field, which is only present in the binary representation, signals the presence of the activation attribute. A value of ”1” means the attribute shall be used and ”0” means the attribute shall not be used.
`MaxForce`	Describes the maximum desirable force for each direction of 3 dimensional axis (x, y and z). (N)
`MaxTorque`	Describes the maximum desirable torque for each direction of 3 dimensional axis (x, y and z). (Nmm)
`forceUnit`	Specifies the unit of the intensity, as a reference to a classification scheme term provided by UnitTypeCS defined in A.2.1 of ISO/IEC 23005-6. If the unit is not specified, the default unit is Newton(N). The reference to the classification scheme shall be done using the `mpeg7:termReferenceType` defined in 7.6 of ISO/IEC 15938-5:2003.

IECNORM.COM : Click to view the full PDF of ISO/IEC 23005-2:2013

© ISO/IEC 2013 – All rights reserved

Name	*Definition*
`torqueUnit`	Specifies the unit of the intensity, as a reference to a classification scheme term provided by UnitTypeCS defined in A.2.1 of ISO/IEC 23005-6. If the unit is not specified, the default unit is Newton millimeter (Nmm). The reference to the classification scheme shall be done using the `mpeg7:termReferenceType` defined in 7.6 of ISO/IEC 15938-5:2003.

7.14.4 Examples

This example of the `KinestheticPrefType` indicates the preference of kinesthetic sensory effect. In this example, a maximum force is considered with values of forces on each axis (Fx =5.0N, Fy=3.0N, Fz=3.5N).

```
<cidl:USPreference xsi:type="sepv:KinestheticPrefType"
forceUnit="urn:mpeg:mpeg-v:01-CI-UnitTypeCS-NS:Newton"
torqueUnit="urn:mpeg:mpeg-v:01-CI-UnitTypeCS-NS:Nmm">
   <sepv:MaxForce>
      <mpegvct:X>5.0</mpegvct:X>
      <mpegvct:Y>3.0</mpegvct:Y>
      <mpegvct:Z>3.5</mpegvct:Z>
   </sepv:MaxForce>
</cidl:USPreference>
```

7.15 RigidBodyMotion preference type

7.15.1 XML representation syntax

```
<!-- ################################################ -->
<!-- RigidBodyMotion Preference type                  -->
<!-- ################################################ -->
<complexType name="RigidBodyMotionPrefType">
   <complexContent>
      <extension base="cidl:UserSensoryPreferenceBaseType">
         <sequence maxOccurs="unbounded">
            <element name="MotionPreference"
               type="sepv:MotionPreferenceBaseType"/>
         </sequence>
      </extension>
   </complexContent>
</complexType>

<!-- ################################################ -->
<!--  Motion Preference base type                     -->
<!-- ################################################ -->
<complexType name="MotionPreferenceBaseType" abstract="true">
   <attribute name="unfavor" type="boolean" use="optional" default="0"/>
</complexType>

<!-- ################################################ -->
<!--  Move Toward Preference type                     -->
<!-- ################################################ -->
<complexType name="MoveTowardPreferenceType">
   <complexContent>
      <extension base="sepv:MotionPreferenceBaseType">
```

IECNORM.COM : Click to view the full PDF of ISO/IEC 23005-2:2013

© ISO/IEC 2013 – All rights reserved

```
            <attribute name="maxMoveDistance" type="unsignedInt" use="optional"/>
            <attribute name="maxMoveSpeed" type="float" use="optional"/>
            <attribute name="maxMoveAccel" type="float" use="optional"/>
            <attribute name="distanceUnit" type="mpegvct:unitType" use="optional"/>
            <attribute name="speedUnit" type="mpegvct:unitType" use="optional"/>
            <attribute name="accelUnit" type="mpegvct:unitType" use="optional"/>
        </extension>
    </complexContent>
</complexType>

<!-- ################################################ -->
<!--  Incline Preference type                         -->
<!-- ################################################ -->
<complexType name="InclinePreferenceType">
    <complexContent>
        <extension base="sepv:MotionPreferenceBaseType">
            <attribute name="maxRotationAngle" type="float" use="optional"/>
            <attribute name="maxRotationSpeed" type="float" use="optional"/>
            <attribute name="maxRotationAccel" type="float" use="optional"/>
            <attribute name="angleUnit" type="mpegvct:unitType" use="optional"/>
            <attribute name="speedUnit" type="mpegvct:unitType" use="optional"/>
            <attribute name="accelUnit" type="mpegvct:unitType" use="optional"/>
        </extension>
    </complexContent>
</complexType>

<!-- ################################################ -->
<!--  Wave Preference type                            -->
<!-- ################################################ -->
<complexType name="WavePreferenceType">
    <complexContent>
        <extension base="sepv:MotionPreferenceBaseType">
            <attribute name="maxWaveDistance" type="float" use="optional"/>
            <attribute name="maxWaveSpeed" type="float" use="optional"/>
            <attribute name="distanceUnit" type="mpegvct:unitType" use="optional"/>
            <attribute name="speedUnit" type="mpegvct:unitType" use="optional"/>
        </extension>
    </complexContent>
</complexType>

<!-- ################################################ -->
<!--  Collide Preference type                         -->
<!-- ################################################ -->
<complexType name="CollidePreferenceType">
    <complexContent>
        <extension base="sepv:MotionPreferenceBaseType">
            <attribute name="maxCollideSpeed" type="float" use="optional"/>
            <attribute name="speedUnit" type="mpegvct:unitType" use="optional"/>
        </extension>
    </complexContent>
</complexType>

<!-- ################################################ -->
<!--  Turn Preference type                            -->
<!-- ################################################ -->
<complexType name="TurnPreferenceType">
    <complexContent>
        <extension base="sepv:MotionPreferenceBaseType">
            <attribute name="maxTurnSpeed" type="float" use="optional"/>
```

IECNORM.COM : Click to view the full PDF of ISO/IEC 23005-2:2013

© ISO/IEC 2013 – All rights reserved

```
            <attribute name="speedUnit" type="mpegvct:unitType" use="optional"/>
        </extension>
    </complexContent>
</complexType>

<!-- ################################################ -->
<!--  Shake Preference type                           -->
<!-- ################################################ -->
<complexType name="ShakePreferenceType">
    <complexContent>
        <extension base="sepv:MotionPreferenceBaseType">
            <attribute name="maxShakeDistance" type="float" use="optional"/>
            <attribute name="maxShakeSpeed" type="float" use="optional"/>
            <attribute name="distanceUnit" type="mpegvct:unitType" use="optional"/>
            <attribute name="speedUnit" type="mpegvct:unitType" use="optional"/>
        </extension>
    </complexContent>
</complexType>

<!-- ################################################ -->
<!--  Spin Preference type                            -->
<!-- ################################################ -->
<complexType name="SpinPreferenceType">
    <complexContent>
        <extension base="sepv:MotionPreferenceBaseType">
            <attribute name="maxSpinSpeed" type="float" use="optional"/>
            <attribute name="speedUnit" type="mpegvct:unitType" use="optional"/>
        </extension>
    </complexContent>
</complexType>
```

IECNORM.COM : Click to view the full PDF of ISO/IEC 23005-2:2013

7.15.2 Binary representation syntax

RigidBodyMotionPrefType {	**(Number of bits)**	**(Mnemonic)**
UserSensoryPreferenceBase		UserSensoryPreferenceBaseType
LoopMotionPreference	4	uimsbf
for(k=0;k< LoopMotionPreference;k++){		
MotionPreferenceType[k]	4	bslbf
MotionPreference[k]		MotionPreferenceBaseType
}		
}		
MotionPreferenceBaseType {		
unfavorFlag	1	bslbf
if(unfavorFlag){		
unfavor	1	bslbf

© ISO/IEC 2013 – All rights reserved

RigidBodyMotionPrefType {	**(Number of bits)**	**(Mnemonic)**
}		
}		
MoveTowardPreferenceType {		
MaxMoveDistanceFlag	1	bslbf
MaxMoveSpeedFlag	1	bslbf
MaxMoveAccelFlag	1	bslbf
distanceUnitFlag	1	bslbf
speedUnitFlag	1	bslbf
accelUnitFlag	1	bslbf
MotionPreferenceBase		MotionPreferenceBaseType
if(MaxMoveDistanceFlag){		
MaxMoveDistance	8	uimsbf
}		
if(MaxMoveSpeedFlag){		
MaxMoveSpeed	32	fsbf
}		
if(MaxMoveAccelFlag){		
MaxMoveAccel	32	fsbf
}		
if(distanceUnitFlag){		
distanceUnit	8	bslbf
}		
if(speedUnitFlag){		
speedUnit	8	bslbf
}		
if(accelUnitFlag){		
accelUnit	8	bslbf

IECNORM.COM : Click to view the full PDF of ISO/IEC 23005-2:2013

© ISO/IEC 2013 – All rights reserved

RigidBodyMotionPrefType {	**(Number of bits)**	**(Mnemonic)**
}		
}		
InclinePreferenceType {		
MaxRotationAngleFlag	1	bslbf
MaxRotationSpeedFlag	1	bslbf
MaxRotationAccelFlag	1	bslbf
angleUnitFlag	1	bslbf
speedUnitFlag	1	bslbf
accelUnitFlag	1	bslbf
MotionPreferenceBase		MotionPreferenceBaseType
if(MaxRotationAngleFlag){		
MaxRotationAngle	32	fsbf
}		
if(MaxRotationSpeedFlag){		
MaxRotationSpeed	32	fsbf
}		
if(MaxRotationAccelFlag){		
MaxRotationAccel	32	fsbf
}		
if(angleUnitFlag){		
angleUnit	8	bslbf
}		
if(speedUnitFlag){		
speedUnit	8	bslbf
}		
if(accelUnitFlag){		
accelUnit	8	bslbf

IECNORM.COM : Click to view the full PDF of ISO/IEC 23005-2:2013

© ISO/IEC 2013 – All rights reserved