ZigBee Lighting & Occupancy Device Specification Version 1.0

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Abstract	This specification defines the protocol infrastructures and services available to lighting and occupancy applications operating on the ZigBee PRO platform.
Keywords	L&O, ZLL, ZHA, consumer, residential, lighting, Light Link.

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Revision history

Revision	Date	Details	Editor
00	January 14th, 2015	First version originated from 13-0257-03.	Phil Jamieson
01	April 13th, 2015	Updated as a result of the L&O WG v0.7 ballot comments in document 15-0089.	Phil Jamieson
02	September 30th, 2015	Updated to match ZCL r06. Added mandatory PICS references for the devices.	Phil Jamieson
03	October 30th, 2015	Addressed comments from the v0.9 ballot.	Phil Jamieson
04	December 4th, 2015	Addressed comments from ZigBee 3.0 SVE #1.	Phil Jamieson
05	February 24th, 2016	Updated the document designation and legal messages.	Phil Jamieson

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1 Introduction

This document specifies the ZigBee Lighting and Occupancy (ZLO) device behavior for operation on a ZigBee-PRO network.

This specification addresses devices and functionality in the lighting application domain. The individual device specifications will become part of the approved device specifications supported by the ZigBee Alliance. It is based on and conforms to ZigBee-PRO, the Base Device Behavior and the ZigBee Cluster Library.

This document is based on the work carried out by the ZigBee Light Link working group in the ZLL v1.0 profile specification (see [R3]). In addition it collects together the lighting features of both the ZigBee Home Automation (see [R4]) and ZigBee Building Automation (see [R2]) specifications.

Note: The content of this document is an evolution from the ZLL v1.1 specification (13-0258-03 draft and 13-0257-03 editor's copies) wherein the device descriptions of clause 5 have been merged with the clusters descriptions of clause 6. Each device description is now presented as a self-contained, standalone entity which details not only the mandatory clusters it must support but also the required list of attributes and commands from each mandatory cluster. The remaining ZCL enhancements from clause 6, required from the ZLL v1.1 TRD (12-0574-06), remain and can serve as input to future errata to the ZCL. There has been no additional new information added in this document which was not already contained in the old documents.

1.1 Scope

The scope of the devices defined in this specification is as follows:

- It is intended for ZigBee applications in residential, commercial and hospitality lighting.
- It is intended to be built on the ZigBee-PRO stack.
- It is intended to be natively interoperable with other ZigBee-PRO devices.
- It is not initially intended for professional outdoor lighting networks.

1.2 Purpose

The purpose of this specification is as follows:

- To provide an evolutionary experience for lighting devices in which further purchases enhance the overall system.
- To develop a simple and sensible ZigBee specification for over-the-counter lamps and luminaries in the consumer market space.
- To develop a solution, fully in line with consumer market boundary conditions on commissioning, security, ease of use, network scale, cost, etc.
- To be able to address non-installer consumer lighting related features.

1.3 Conformance levels

The key words "SHALL", "SHALL NOT" and "MAY" in this document are to be interpreted as described in [R17].

1.4 Conventions

1.4.1 Number formats

In this specification hexadecimal numbers are prefixed with the designation "0x" and binary numbers are prefixed with the designation "0b". All other numbers are assumed to be decimal unless indicated otherwise within the associated text.

1.4.2 Transmission order

The frames in this specification are described as a sequence of fields in a specific order. All frame formats are depicted in the order in which they are transmitted by the PHY, from left to right where the leftmost bit is transmitted first in time or top to bottom where the topmost bit is transmitted first in time. Bits within each field are numbered from 0 (leftmost and least significant) to k-1 (rightmost and most significant), where the length of the field is k bits. Fields that are longer than a single octet are sent to the MAC in the order from the octet containing the lowest numbered bits to the octet containing the highest numbered bits.

1.4.3 Reserved values

Unless otherwise specified, all reserved fields appearing in a frame structure SHALL be set to zero on transmission and ignored upon reception. Reserved values appearing in multi-value fields SHALL not be used.

1.4.4 Clusters

When clusters are listed in connection with required attributes or commands that must be supported, "(S)" indicates the item is related to the *server* side of the cluster and "(C)" indicates the item is related to the *client* side of the cluster.

1.4.5 Attribute lists

Each device description includes a list of required attributes that must be supported. The "Scene table" and "Reportable" columns give extra information as follows.

The "Scene table" column indicates whether the attribute must be included in the scene table should the *scenes* cluster be supported on the device. A "✓" symbol indicates that the attribute SHALL be included in the scene table and a "✗" symbol indicates that the attribute SHALL NOT be included in the scene table.

The "Reportable" column indicates whether the attribute must be reportable. A "✓" symbol indicates that the attribute SHALL be reportable and a "-" symbol indicates that it is not mandatory for the attribute to be reportable, i.e. an implementation can optionally make the attribute reportable.

1.4.6 Permitted transmissions

Where a device is indicated as generating a command, the permitted transmission modes are indicated as a three character coding representing from left to right whether unicast ("U"), groupcast ("G") or broadcast ("B") transmissions are permitted. Where a transmission mode is not permitted, it is replaced with a hyphen "-". For example, "UGB" indicates that unicast, groupcast and broadcast transmissions are permitted whereas "U--" indicates that only unicast transmissions are permitted.

1.5 Errata

Any errata against this specification can be found in [R16].

2 References[1]

2.1 ZigBee Alliance documents

[R1] ZigBee Cluster Library Specification, ZigBee Alliance document 07-5123.
[R2] ZigBee Building Automation Specification, ZigBee Alliance document 07-5449.
[R3] ZigBee Light Link Specification, ZigBee Alliance document 11-0037.
[R4] ZigBee Home Automation Specification, ZigBee Alliance document 11-5382.
[R5] ZigBee Base Device Behavior Specification, ZigBee Alliance document 13-0402.
[R6] ZigBee Cluster Library Basic Cluster (0x0000) Test Specification, ZigBee Alliance document 15-0302.
[R7] ZigBee Cluster Library Identify Cluster (0x0003) Test Specification, ZigBee Alliance document 15-0304.
[R8] ZigBee Cluster Library Groups Cluster (0x0004) Test Specification, ZigBee Alliance document 15-0306.
[R9] ZigBee Cluster Library Scenes Cluster (0x0005) Test Specification, ZigBee Alliance document 15-0308.
[R10] ZigBee Cluster Library On/Off Cluster (0x0006) Test Specification, ZigBee Alliance document 15-0310.
[R11] ZigBee Cluster Library Level Control Cluster (0x0008) Test Specification, ZigBee Alliance document 15-0312.
[R12] ZigBee Cluster Library Color Control Cluster (0x0300) Test Specification, ZigBee Alliance document 15-0314.
[R13] ZigBee Cluster Library Illuminance Measurement Cluster (0x0400) Test Specification, ZigBee Alliance document 15-0316.
[R14] ZigBee Cluster Library Occupancy Sensing Cluster (0x0406) Test Specification, ZigBee Alliance document 15-0318.
[R15] ZigBee Cluster Library Touchlink Commissioning Cluster (0x1000) Test Specification, ZigBee Alliance document 15-0320.
[R16] Errata for L&O Device Specification 15-0014, ZigBee Alliance document 15-06003.

2.2 IETF documents

[R17] S. Bradner, Key words for use in RFCs to Indicate Requirement Levels, IETF RFC 2119, March 1997.

[1] The version and date information in these references was correct at the time this document was released.

3 Definitions

Coordinator	The ZigBee node responsible for starting a network and allowing other devices to join this network in a secure way. A coordinator is also a router.
Device	Product implementation of a device description specified in this document.
End-device	A ZigBee node which has no capability of routing messages through the network.
Endpoint	A ZigBee endpoint implements application features that are non-networking related (which the exception of the mandatory endpoint 0 which handles the node's network management functions).
Factory New	The device does not contain any network parameters and is not part of a network. When a device is reset to factory new, its network parameters are erased.
IEEE Address	An 8-byte unique address. Sometimes also referred to as the MAC address.
Network Parameters	Set of extended PAN ID, PAN ID, channel number, network update ID, network address and network key.
Node	A collection of independent device descriptions and applications residing in a single unit and sharing a common IEEE 802.15.4 radio.
Router	A ZigBee node capable of routing messages through the network and acting as a parent for end-devices.
Sub-device	A device may be divided in sub-devices when it has more application endpoints, for example two independent light outputs.
Touchlink	The user operation of holding one device (e.g., a remote controller) physically close to another device (e.g., a light) in order to facilitate a network connection.

4 Acronyms and abbreviations

CFL	Compact fluorescent
EAN	International article number
GTIN	Global trade item number
ID	Identifier
IEEE	Institute of electrical and electronic engineers
IETF	Internet engineering task force
LED	Light emitting diode
MAC	Medium access control
NIB	Network information base
OTA	Over the air
PAN	Personal area network
PHY	Physical
RFC	Request for comments
SKU	Stock keeping unit
UPC	Universal product code
URL	Universal resource locator
ZCL	ZigBee cluster library
ZHA	ZigBee home automation
ZLL	ZigBee Light Link

5 Device descriptions

Table 1 lists the Lighting & Occupancy device descriptions defined in this specification. Each device is identified by a unique ZigBee-wide device ID and SHALL use the profile identifier 0x0104.

Each device listed in Table 1 is described in detail in the following sub-clauses.

For details on the use of the various commissioning mechanisms that are available for a device, please see [R5].

Table 1 – Device descriptions defined in this specification

Device ID	Description	Reference
0x0100	On/off light	6
0x0101	Dimmable light	7
0x0102	Color dimmable light	8
0x0103	On/off light switch	9
0x0104	Dimmer switch	10
0x0105	Color dimmer switch	11
0x0106	Light sensor	12
0x0107	Occupancy sensor	13
0x0108	On/off ballast	14
0x0109	Dimmable ballast	15
0x010a	On/off plug-in unit	16
0x010b	Dimmable plug-in unit	17
0x010c	Color temperature light	18
0x010d	Extended color light	19
0x010e	Light level sensor	20
0x0800	Color controller	21
0x0810	Color scene controller	22
0x0820	Non-color controller	23
0x0830	Non-color scene controller	24
0x0840	Control bridge	25
0x0850	On/off sensor	26

All other values in the range 0x0000-0xffff are not used in this specification.

6 On/off light

The on/off light is a lighting device that can be switched on or off via a bound controller device such as an on/off light switch or a non-color controller. In addition, it may also be switched via a bound occupancy sensor.

6.1 Device configuration

When the on/off light device type is implemented on an endpoint, the following configurations apply:

- The *application device version* field of the corresponding simple descriptor SHALL be set to 0x1.
- The device class SHALL be *simple*.
- The device SHALL implement a finding & binding *target*.

6.2 Supported clusters

The on/off light device SHALL support the mandatory clusters and MAY support the recommended optional clusters listed in Figure 1.

	On/off light [Device ID: 0x0100]	
	Server clusters	**Client clusters**
Mandatory	0x0000: Basic	*None*
	0x0003: Identify	
	0x0004: Groups	
	0x0005: Scenes	
	0x0006: On/off	
Recommended optional	*0x0008: Level control*	*OTA upgrade: 0x0019*
	0x1000: Touchlink commissioning	*Occupancy sensing: 0x0406*

Figure 1 – Clusters supported by the on/off light device type

The inclusion of the *level control* cluster on this device is recommended to provide a consistent user experience when the device is grouped with additional dimmable lights and the "with on/off" commands are used. For this device, since its only states are on or off, if the *level control* cluster is implemented, it SHALL not have any effect on the actual light level except for those commands that cause an on/off state change, i.e. the "with on/off" commands. In addition, if the *level control* cluster is implemented, the device SHALL accept and process *level control* cluster commands, adjusting the value of the *CurrentLevel* attribute accordingly and, where necessary, adjusting the *on/off* cluster *OnOff* attribute as described in [R1].

6.2.1 Required attributes

An on/off light device SHALL support the attributes listed in Table 2.

Table 2 – Mandatory attributes for an on/off light

Cluster	Identifier	Name	Scene table	Reportable
Basic (S)	0x0000	ZCLVersion	✖	-
Basic (S)	0x0001	ApplicationVersion	✖	-

Cluster	Identifier	Name	Scene table	Reportable
Basic (S)	0x0002	StackVersion	✗	-
Basic (S)	0x0003	HWVersion	✗	-
Basic (S)	0x0004	ManufacturerName	✗	-
Basic (S)	0x0005	ModelIdentifier	✗	-
Basic (S)	0x0006	DateCode	✗	-
Basic (S)	0x0007	PowerSource	✗	-
Basic (S)	0x0008	GenericDeviceClass	✗	-
Basic (S)	0x0009	GenericDeviceType	✗	-
Basic (S)	0x000a	ProductCode	✗	-
Basic (S)	0x000b	ProductURL	✗	-
Basic (S)	0x4000	SWBuildID	✗	-
Identify (S)	0x0000	IdentifyTime	✗	-
Groups (S)	0x0000	NameSupport	✗	-
Scenes (S)	0x0000	SceneCount	✗	-
Scenes (S)	0x0001	CurrentScene	✗	-
Scenes (S)	0x0002	CurrentGroup	✗	-
Scenes (S)	0x0003	SceneValid	✗	-
Scenes (S)	0x0004	NameSupport	✗	-
On/off (S)	0x0000	OnOff	✓	✓
On/off (S)	0x4000	GlobalSceneControl	✗	-
On/off (S)	0x4001	OnTime	✗	-
On/off (S)	0x4002	OffWaitTime	✗	-
On/off (S)	0x4003	StartUpOnOff	✗	-
All supported clusters (S&C)	0xfffd	ClusterRevision	✗	-

6.2.2 Required commands received

An on/off light device SHALL be able to receive and process the commands listed in Table 3.

Table 3 – Mandatory commands received by an on/off light

Cluster	Identifier	Name
Identify (S)	0x00	Identify
Identify (S)	0x01	Identify query

Cluster	Identifier	Name
Identify (S)	0x40	Trigger effect
Groups (S)	0x00	Add group
Groups (S)	0x01	View group
Groups (S)	0x02	Get group membership
Groups (S)	0x03	Remove group
Groups (S)	0x04	Remove all groups
Groups (S)	0x05	Add group if identifying
Scenes (S)	0x00	Add scene
Scenes (S)	0x01	View scene
Scenes (S)	0x02	Remove scene
Scenes (S)	0x03	Remove all scenes
Scenes (S)	0x04	Store scene
Scenes (S)	0x05	Recall scene
Scenes (S)	0x06	Get scene membership
Scenes (S)	0x40	Enhanced add scene
Scenes (S)	0x41	Enhanced view scene
Scenes (S)	0x42	Copy scene
On/off (S)	0x00	Off
On/off (S)	0x01	On
On/off (S)	0x02	Toggle
On/off (S)	0x40	Off with effect
On/off (S)	0x41	On with recall global scene
On/off (S)	0x42	On with timed off

6.2.3 Required commands generated

An on/off light device SHALL be able to generate the commands listed in Table 4.

Table 4 – Mandatory commands generated by an on/off light

Cluster	Identifier	Name	On receipt of	Permitted transmissions
Identify (S)	0x00	Identify query response	Identify query	U--
Groups (S)	0x00	Add group response	Add group	U--
Groups (S)	0x01	View group response	View group	U--
Groups (S)	0x02	Get group membership response	Get group membership	U--
Groups (S)	0x03	Remove group response	Remove group	U--

Cluster	Identifier	Name	On receipt of	Permitted transmissions
Scenes (S)	0x00	Add scene response	Add scene	U--
Scenes (S)	0x01	View scene response	View scene	U--
Scenes (S)	0x02	Remove scene response	Remove scene	U--
Scenes (S)	0x03	Remove all scenes response	Remove all scenes	U--
Scenes (S)	0x04	Store scene response	Store scene	U--
Scenes (S)	0x06	Get scene membership response	Get scene membership	U--
Scenes (S)	0x40	Enhanced add scene response	Enhanced add scene	U--
Scenes (S)	0x41	Enhanced view scene response	Enhanced view scene	U--
Scenes (S)	0x42	Copy scene response	Copy scene	U--

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6.3 PICS

The following PICS items SHALL be supported for this device. Note that a device MAY support other optional PICS items.

Cluster	PICS item
Basic [R6]	B.S B.S.A0000, B.S.A0001, B.S.A0002, B.S.A0003, B.S.A0004, B.S.A0005, B.S.A0006, B.S.A0007, B.S.A0008, B.S.A0009, B.S.A000a, B.S.A000b, B.S.A4000, B.S.Afffd
Identify [R7]	I.S I.S.A0000, I.S.Afffd I.S.C00.Rsp, I.S.C01.Rsp, I.S.C40.Rsp I.S.C00.Tx
Groups [R8]	G.S G.S.A0000, G.S.Afffd G.S.C00.Rsp, G.S.C01.Rsp, G.S.C02.Rsp, G.S.C03.Rsp, G.S.C04.Rsp, G.S.C05.Rsp G.S.C00.Tx, G.S.C01.Tx, G.S.C02.Tx, G.S.C03.Tx
Scenes [R9]	S.S S.S.A0000, S.S.A0001, S.S.A0002, S.S.A0003, S.S.A0004, S.S.Afffd S.S.C00.Rsp, S.S.C01.Rsp, S.S.C02.Rsp, S.S.C03.Rsp, S.S.C04.Rsp, S.S.C05.Rsp, S.S.C06.Rsp, S.S.C40.Rsp, S.S.C41.Rsp, S.S.C42.Rsp S.S.C00.Tx, S.S.C01.Tx, S.S.C02.Tx, S.S.C03.Tx, S.S.C04.Tx, S.S.C06.Tx, S.S.C40.Tx, S.S.C41.Tx, S.S.C42.Tx
On/off [R10]	OO.S OO.S.A0000, OO.S.A4000, OO.S.A4001, OO.S.A4002, OO.S.A4003, OO.S.Afffd OO.S.C00.Rsp, OO.S.C01.Rsp, OO.S.C02.Rsp, OO.S.C40.Rsp, OO.S.C41.Rsp, OO.S.C42.Rsp

7 Dimmable light

The dimmable light is a lighting device that can be switched on or off and the intensity of its light adjusted via a bound controller device such as a dimmer switch or a non-color controller. In addition, it may also be switched via a bound occupancy sensor.

7.1 Device configuration

When the dimmable light device type is implemented on an endpoint, the following configurations apply:

- The *application device version* field of the corresponding simple descriptor SHALL be set to 0x1.
- The device class SHALL be *simple*.
- The device SHALL implement a finding & binding *target*.
- The minimum light level SHALL be 0x01 and the maximum light level SHALL be 0xfe.

7.2 Supported clusters

The dimmable light device SHALL support the mandatory clusters and MAY support the recommended optional clusters listed in Figure 2.

	Dimmable light [Device ID: 0x0101]	
	Server clusters	**Client clusters**
Mandatory	0x0000: Basic	*None*
	0x0003: Identify	
	0x0004: Groups	
	0x0005: Scenes	
	0x0006: On/off	
	0x0008: Level control	
Recommended optional	*0x1000: Touchlink commissioning*	*OTA upgrade: 0x0019*
		Occupancy sensing: 0x0406

Figure 2 – Clusters supported by the dimmable light device type

7.2.1 Required attributes

A dimmable light device SHALL support the attributes listed in Table 5.

Table 5 – Mandatory attributes for a dimmable light

Cluster	Identifier	Name	Scene table	Reportable
Basic (S)	0x0000	ZCLVersion	×	-
Basic (S)	0x0001	ApplicationVersion	×	-
Basic (S)	0x0002	StackVersion	×	-
Basic (S)	0x0003	HWVersion	×	-

Cluster	Identifier	Name	Scene table	Reportable
Basic (S)	0x0004	ManufacturerName	✗	-
Basic (S)	0x0005	ModelIdentifier	✗	-
Basic (S)	0x0006	DateCode	✗	-
Basic (S)	0x0007	PowerSource	✗	-
Basic (S)	0x0008	GenericDeviceClass	✗	-
Basic (S)	0x0009	GenericDeviceType	✗	-
Basic (S)	0x000a	ProductCode	✗	-
Basic (S)	0x000b	ProductURL	✗	-
Basic (S)	0x4000	SWBuildID	✗	-
Identify (S)	0x0000	IdentifyTime	✗	-
Groups (S)	0x0000	NameSupport	✗	-
Scenes (S)	0x0000	SceneCount	✗	-
Scenes (S)	0x0001	CurrentScene	✗	-
Scenes (S)	0x0002	CurrentGroup	✗	-
Scenes (S)	0x0003	SceneValid	✗	-
Scenes (S)	0x0004	NameSupport	✗	-
On/off (S)	0x0000	OnOff	✓	✓
On/off (S)	0x4000	GlobalSceneControl	✗	-
On/off (S)	0x4001	OnTime	✗	-
On/off (S)	0x4002	OffWaitTime	✗	-
On/off (S)	0x4003	StartUpOnOff	✗	-
Level control (S)	0x0000	CurrentLevel	✓	✓
Level control (S)	0x0001	RemainingTime	✗	-
Level control (S)	0x000f	Options	✗	-
Level control (S)	0x4000	StartUpCurrentLevel	✗	-
All supported clusters (S&C)	0xfffd	ClusterRevision	✗	-

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527 7.2.2 Required commands received

528 A dimmable light device SHALL be able to receive and process the commands listed in Table 6.

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530 **Table 6 – Mandatory commands received by a dimmable light**

Cluster	Identifier	Name
Identify (S)	0x00	Identify
Identify (S)	0x01	Identify query
Identify (S)	0x40	Trigger effect
Groups (S)	0x00	Add group
Groups (S)	0x01	View group
Groups (S)	0x02	Get group membership
Groups (S)	0x03	Remove group
Groups (S)	0x04	Remove all groups
Groups (S)	0x05	Add group if identifying
Scenes (S)	0x00	Add scene
Scenes (S)	0x01	View scene
Scenes (S)	0x02	Remove scene
Scenes (S)	0x03	Remove all scenes
Scenes (S)	0x04	Store scene
Scenes (S)	0x05	Recall scene
Scenes (S)	0x06	Get scene membership
Scenes (S)	0x40	Enhanced add scene
Scenes (S)	0x41	Enhanced view scene
Scenes (S)	0x42	Copy scene
On/off (S)	0x00	Off
On/off (S)	0x01	On
On/off (S)	0x02	Toggle
On/off (S)	0x40	Off with effect
On/off (S)	0x41	On with recall global scene
On/off (S)	0x42	On with timed off
Level control (S)	0x00	Move to level
Level control (S)	0x01	Move
Level control (S)	0x02	Step
Level control (S)	0x03	Stop
Level control (S)	0x04	Move to level (with on/off)
Level control (S)	0x05	Move (with on/off)
Level control (S)	0x06	Step (with on/off)
Level control (S)	0x07	Stop (with on/off)

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7.2.3 Required commands generated

A dimmable light device SHALL be able to generate the commands listed in Table 7.

Table 7 – Mandatory commands generated by a dimmable light

Cluster	Identifier	Name	On receipt of	Permitted transmissions
Identify (S)	0x00	Identify query response	Identify query	U--
Groups (S)	0x00	Add group response	Add group	U--
Groups (S)	0x01	View group response	View group	U--
Groups (S)	0x02	Get group membership response	Get group membership	U--
Groups (S)	0x03	Remove group response	Remove group	U--
Scenes (S)	0x00	Add scene response	Add scene	U--
Scenes (S)	0x01	View scene response	View scene	U--
Scenes (S)	0x02	Remove scene response	Remove scene	U--
Scenes (S)	0x03	Remove all scenes response	Remove all scenes	U--
Scenes (S)	0x04	Store scene response	Store scene	U--
Scenes (S)	0x06	Get scene membership response	Get scene membership	U--
Scenes (S)	0x40	Enhanced add scene response	Enhanced add scene	U--
Scenes (S)	0x41	Enhanced view scene response	Enhanced view scene	U--
Scenes (S)	0x42	Copy scene response	Copy scene	U--

7.3 PICS

The following PICS SHALL be supported for this device. Note that a device MAY support other optional PICS items.

Cluster	PICS
Basic [R6]	B.S B.S.A0000, B.S.A0001, B.S.A0002, B.S.A0003, B.S.A0004, B.S.A0005, B.S.A0006, B.S.A0007, B.S.A0008, B.S.A0009, B.S.A000a, B.S.A000b, B.S.A4000, B.S.Afffd
Identify [R7]	I.S I.S.A0000, I.S.Afffd I.S.C00.Rsp, I.S.C01.Rsp, I.S.C40.Rsp I.S.C00.Tx
Groups [R8]	G.S G.S.A0000, G.S.Afffd G.S.C00.Rsp, G.S.C01.Rsp, G.S.C02.Rsp, G.S.C03.Rsp, G.S.C04.Rsp, G.S.C05.Rsp G.S.C00.Tx, G.S.C01.Tx, G.S.C02.Tx, G.S.C03.Tx
Scenes [R9]	S.S S.S.A0000, S.S.A0001, S.S.A0002, S.S.A0003, S.S.A0004, S.S.Afffd S.S.C00.Rsp, S.S.C01.Rsp, S.S.C02.Rsp, S.S.C03.Rsp, S.S.C04.Rsp, S.S.C05.Rsp, S.S.C06.Rsp, S.S.C40.Rsp, S.S.C41.Rsp, S.S.C42.Rsp S.S.C00.Tx, S.S.C01.Tx, S.S.C02.Tx, S.S.C03.Tx, S.S.C04.Tx, S.S.C06.Tx, S.S.C40.Tx, S.S.C41.Tx, S.S.C42.Tx
On/off [R10]	OO.S OO.S.A0000, OO.S.A4000, OO.S.A4001, OO.S.A4002, OO.S.A4003, OO.S.Afffd OO.S.C00.Rsp, OO.S.C01.Rsp, OO.S.C02.Rsp, OO.S.C40.Rsp, OO.S.C41.Rsp, OO.S.C42.Rsp
Level Control [R11]	LC.S LC.S.A0000, LC.S.A0001, LC.S.A000f, LC.S.A4000, LC.S.Afffd LC.S.C00.Rsp, LC.S.C01.Rsp, LC.S.C02.Rsp, LC.S.C03.Rsp, LC.S.C04.Rsp, LC.S.C05.Rsp, LC.S.C06.Rsp, LC.S.C07.Rsp

8 Color dimmable light

The color light is a lighting device that can be switched on or off, the intensity of its light adjusted and its color adjusted via a bound controller device such as a color controller. The device supports adjustment of color via hue/saturation, enhanced hue, color looping and XY coordinates. In addition, it may also be switched via a bound occupancy sensor.

8.1 Device configuration

When the color dimmable light device type is implemented on an endpoint, the following configurations apply:

- The *application device version* field of the corresponding simple descriptor SHALL be set to 0x1.
- The device class SHALL be *simple*.
- The device SHALL implement a finding & binding *target*.
- The minimum light level SHALL be 0x01 and the maximum light level SHALL be 0xfe.

8.2 Supported clusters

The color dimmable light device SHALL support the mandatory clusters and MAY support the recommended optional clusters listed in Figure 3.

	Color dimmable light [Device ID: 0x0102]	
	Server clusters	**Client clusters**
Mandatory	0x0000: Basic	*None*
	0x0003: Identify	
	0x0004: Groups	
	0x0005: Scenes	
	0x0006: On/off	
	0x0008: Level control	
	0x0300: Color control	
Recommended optional	*0x1000: Touchlink commissioning*	*OTA upgrade: 0x0019*
		Occupancy sensing: 0x0406

Figure 3 – Clusters supported by the color dimmable light device type

8.2.1 Required attributes

A color dimmable light device SHALL support the attributes listed in Table 8.

Table 8 – Mandatory attributes for a color dimmable light

Cluster	Identifier	Name	Scene table	Reportable
Basic (S)	0x0000	ZCLVersion	✖	-
Basic (S)	0x0001	ApplicationVersion	✖	-
Basic (S)	0x0002	StackVersion	✖	-

Cluster	Identifier	Name	Scene table	Reportable
Basic (S)	0x0003	HWVersion	×	-
Basic (S)	0x0004	ManufacturerName	×	-
Basic (S)	0x0005	ModelIdentifier	×	-
Basic (S)	0x0006	DateCode	×	-
Basic (S)	0x0007	PowerSource	×	-
Basic (S)	0x0008	GenericDeviceClass	×	-
Basic (S)	0x0009	GenericDeviceType	×	-
Basic (S)	0x000a	ProductCode	×	-
Basic (S)	0x000b	ProductURL	×	-
Basic (S)	0x4000	SWBuildID	×	-
Identify (S)	0x0000	IdentifyTime	×	-
Groups (S)	0x0000	NameSupport	×	-
Scenes (S)	0x0000	SceneCount	×	-
Scenes (S)	0x0001	CurrentScene	×	-
Scenes (S)	0x0002	CurrentGroup	×	-
Scenes (S)	0x0003	SceneValid	×	-
Scenes (S)	0x0004	NameSupport	×	-
On/off (S)	0x0000	OnOff	✓	✓
On/off (S)	0x4000	GlobalSceneControl	×	-
On/off (S)	0x4001	OnTime	×	-
On/off (S)	0x4002	OffWaitTime	×	-
On/off (S)	0x4003	StartUpOnOff	×	-
Level control (S)	0x0000	CurrentLevel	✓	✓
Level control (S)	0x0001	RemainingTime	×	-
Level control (S)	0x000f	Options	×	-
Level control (S)	0x4000	StartUpCurrentLevel	×	-
Color control (S)	0x0000	CurrentHue	×[2]	✓
Color control (S)	0x0001	CurrentSaturation	✓	✓
Color control (S)	0x0002	RemainingTime	×	-
Color control (S)	0x0003	CurrentX	✓	✓
Color control (S)	0x0004	CurrentY	✓	✓

[2] Note that the *EnhancedCurrentHue* attribute is added to the scene table in favor of the *CurrentHue* attribute.

Cluster	Identifier	Name	Scene table	Reportable
Color control (S)	0x0008	ColorMode	✖	-
Color control (S)	0x000f	Options	✖	-
Color control (S)	0x0010	NumberOfPrimaries[3]	✖	-
Color control (S)	0x4000	EnhancedCurrentHue	✓	-
Color control (S)	0x4001	EnhancedColorMode	✖	-
Color control (S)	0x4002	ColorLoopActive	✓	-
Color control (S)	0x4003	ColorLoopDirection	✓	-
Color control (S)	0x4004	ColorLoopTime	✓	-
Color control (S)	0x4005	ColorLoopStartEnhancedHue	✖	-
Color control (S)	0x4006	ColorLoopStoredEnhancedHue	✖	-
Color control (S)	0x400a	ColorCapabilities	✖	-
All supported clusters (S&C)	0xfffd	ClusterRevision	✖	-

8.2.2 Required commands received

A color dimmable light device SHALL be able to receive and process the commands listed in Table 9.

Table 9 – Mandatory commands received by a color dimmable light

Cluster	Identifier	Name
Identify (S)	0x00	Identify
Identify (S)	0x01	Identify query
Identify (S)	0x40	Trigger effect
Groups (S)	0x00	Add group
Groups (S)	0x01	View group
Groups (S)	0x02	Get group membership
Groups (S)	0x03	Remove group
Groups (S)	0x04	Remove all groups
Groups (S)	0x05	Add group if identifying
Scenes (S)	0x00	Add scene
Scenes (S)	0x01	View scene
Scenes (S)	0x02	Remove scene
Scenes (S)	0x03	Remove all scenes

[3] A device SHALL also support the attributes Primary*i*X, Primary*i*Y and Primary*i*Intensity, where *i* is in the range from 1 to the value of NumberOfPrimaries.

Cluster	Identifier	Name
Scenes (S)	0x04	Store scene
Scenes (S)	0x05	Recall scene
Scenes (S)	0x06	Get scene membership
Scenes (S)	0x40	Enhanced add scene
Scenes (S)	0x41	Enhanced view scene
Scenes (S)	0x42	Copy scene
On/off (S)	0x00	Off
On/off (S)	0x01	On
On/off (S)	0x02	Toggle
On/off (S)	0x40	Off with effect
On/off (S)	0x41	On with recall global scene
On/off (S)	0x42	On with timed off
Level control (S)	0x00	Move to level
Level control (S)	0x01	Move
Level control (S)	0x02	Step
Level control (S)	0x03	Stop
Level control (S)	0x04	Move to level (with on/off)
Level control (S)	0x05	Move (with on/off)
Level control (S)	0x06	Step (with on/off)
Level control (S)	0x07	Stop (with on/off)
Color control (S)	0x00	Move to hue
Color control (S)	0x01	Move hue
Color control (S)	0x02	Step hue
Color control (S)	0x03	Move to saturation
Color control (S)	0x04	Move saturation
Color control (S)	0x05	Step saturation
Color control (S)	0x06	Move to hue and saturation
Color control (S)	0x07	Move to color
Color control (S)	0x08	Move color
Color control (S)	0x09	Step color
Color control (S)	0x40	Enhanced move to hue
Color control (S)	0x41	Enhanced move hue
Color control (S)	0x42	Enhanced step hue
Color control (S)	0x43	Enhanced move to hue and saturation
Color control (S)	0x44	Color loop set
Color control (S)	0x47	Stop move step

571

572 8.2.3 Required commands generated

573 A color dimmable light device SHALL be able to generate the commands listed in Table 10.
574

575 **Table 10 – Mandatory commands generated by a color dimmable light**

Cluster	Identifier	Name	On receipt of	Permitted transmissions
Identify (S)	0x00	Identify query response	Identify query	U--
Groups (S)	0x00	Add group response	Add group	U--
Groups (S)	0x01	View group response	View group	U--
Groups (S)	0x02	Get group membership response	Get group membership	U--
Groups (S)	0x03	Remove group response	Remove group	U--
Scenes (S)	0x00	Add scene response	Add scene	U--
Scenes (S)	0x01	View scene response	View scene	U--
Scenes (S)	0x02	Remove scene response	Remove scene	U--
Scenes (S)	0x03	Remove all scenes response	Remove all scenes	U--
Scenes (S)	0x04	Store scene response	Store scene	U--
Scenes (S)	0x06	Get scene membership response	Get scene membership	U--
Scenes (S)	0x40	Enhanced add scene response	Enhanced add scene	U--
Scenes (S)	0x41	Enhanced view scene response	Enhanced view scene	U--
Scenes (S)	0x42	Copy scene response	Copy scene	U--

576

577 8.3 Generic usage notes

578 For this device, in the *color control* cluster, the *ColorCapabilities* attribute SHALL be set to 0x000f,
579 indicating support for hue/saturation, enhanced hue, color loop and XY.

580
581

8.4 PICS

The following PICS SHALL be supported for this device. Note that a device MAY support other optional PICS items.

Cluster	PICS
Basic [R6]	B.S B.S.A0000, B.S.A0001, B.S.A0002, B.S.A0003, B.S.A0004, B.S.A0005, B.S.A0006, B.S.A0007, B.S.A0008, B.S.A0009, B.S.A000a, B.S.A000b, B.S.A4000, B.S.Afffd
Identify [R7]	I.S I.S.A0000, I.S.Afffd I.S.C00.Rsp, I.S.C01.Rsp, I.S.C40.Rsp I.S.C00.Tx
Groups [R8]	G.S G.S.A0000, G.S.Afffd G.S.C00.Rsp, G.S.C01.Rsp, G.S.C02.Rsp, G.S.C03.Rsp, G.S.C04.Rsp, G.S.C05.Rsp G.S.C00.Tx, G.S.C01.Tx, G.S.C02.Tx, G.S.C03.Tx
Scenes [R9]	S.S S.S.A0000, S.S.A0001, S.S.A0002, S.S.A0003, S.S.A0004, S.S.Afffd S.S.C00.Rsp, S.S.C01.Rsp, S.S.C02.Rsp, S.S.C03.Rsp, S.S.C04.Rsp, S.S.C05.Rsp, S.S.C06.Rsp, S.S.C40.Rsp, S.S.C41.Rsp, S.S.C42.Rsp S.S.C00.Tx, S.S.C01.Tx, S.S.C02.Tx, S.S.C03.Tx, S.S.C04.Tx, S.S.C06.Tx, S.S.C40.Tx, S.S.C41.Tx, S.S.C42.Tx
On/off [R10]	OO.S OO.S.A0000, OO.S.A4000, OO.S.A4001, OO.S.A4002, OO.S.A4003, OO.S.Afffd OO.S.C00.Rsp, OO.S.C01.Rsp, OO.S.C02.Rsp, OO.S.C40.Rsp, OO.S.C41.Rsp, OO.S.C42.Rsp
Level Control [R11]	LC.S LC.S.A0000, LC.S.A0001, LC.S.A000f, LC.S.A4000, LC.S.Afffd LC.S.C00.Rsp, LC.S.C01.Rsp, LC.S.C02.Rsp, LC.S.C03.Rsp, LC.S.C04.Rsp, LC.S.C05.Rsp, LC.S.C06.Rsp, LC.S.C07.Rsp
Color Control [R12]	CC.S CC.S.A0000, CC.S.A0001, CC.S.A0002, CC.S.A0003, CC.S.A0004, C.S.A0008, CC.S.A000f, CC.S.A0010, CC.S.A4000, CC.S.A4001, CC.S.A4002, CC.S.A4003, CC.S.A4004, CC.S.A4005, CC.S.A4006, CC.S.A400a, CC.S.Afffd CC.S.C00.Rsp, CC.S.C01.Rsp, CC.S.C02.Rsp, CC.S.C03.Rsp, CC.S.C04.Rsp, CC.S.C05.Rsp, CC.S.C06.Rsp, CC.S.C07.Rsp, CC.S.C08.Rsp, CC.S.C09.Rsp, CC.S.C40.Rsp, CC.S.C41.Rsp, CC.S.C42.Rsp, CC.S.C43.Rsp, CC.S.C44.Rsp, CC.S.C47.Rsp

9 On/off light switch

The on/off light switch is a controller device that, when bound to a lighting device such as an on/off light, can be used to switch the device on or off. The on/off light switch may also be configured when bound to a suitable configuration device.

9.1 Device configuration

When the on/off light switch device type is implemented on an endpoint, the following configurations apply:

- The *application device version* field of the corresponding simple descriptor SHALL be set to 0x1.
- The device class SHALL be *simple*.
- The device SHALL implement a finding & binding *initiator*.

9.2 Supported clusters

The on/off light switch device SHALL support the mandatory clusters and MAY support the recommended optional clusters listed in Figure 4.

	On/off light switch [Device ID: 0x0103]	
	Server clusters	**Client clusters**
Mandatory	0x0000: Basic	Identify: 0x0003
	0x0003: Identify	On/off: 0x0006
Recommended optional	*0x0007: On/off switch configuration*	*Groups: 0x0004*
		Scenes: 0x0005
		OTA upgrade: 0x0019

Figure 4 – Clusters supported by the on/off switch device type

9.2.1 Required attributes

An on/off light switch device SHALL support the attributes listed in Table 11.

Table 11 – Mandatory attributes for an on/off light switch

Cluster	Identifier	Name	Scene table	Reportable
Basic (S)	0x0000	ZCLVersion	×	-
Basic (S)	0x0001	ApplicationVersion	×	-
Basic (S)	0x0002	StackVersion	×	-
Basic (S)	0x0003	HWVersion	×	-
Basic (S)	0x0004	ManufacturerName	×	-
Basic (S)	0x0005	ModelIdentifier	×	-
Basic (S)	0x0006	DateCode	×	-
Basic (S)	0x0007	PowerSource	×	-

Cluster	Identifier	Name	Scene table	Reportable
Basic (S)	0x0008	GenericDeviceClass	×	-
Basic (S)	0x0009	GenericDeviceType	×	-
Basic (S)	0x000a	ProductCode	×	-
Basic (S)	0x000b	ProductURL	×	-
Basic (S)	0x4000	SWBuildID	×	-
Identify (S)	0x0000	IdentifyTime	×	-
All supported clusters (S&C)	0xfffd	ClusterRevision	×	-

609

610 ### 9.2.2 Required commands received

611 An on/off light switch device SHALL be able to receive and process the commands listed in Table 12.
612

613 **Table 12 – Mandatory commands received by an on/off light switch**

Cluster	Identifier	Name
Identify (S)	0x00	Identify
Identify (S)	0x01	Identify query
Identify (S)	0x40	Trigger effect

614

615 ### 9.2.3 Commands generated

616 An on/off light switch device SHALL generate the commands indicated with an asterisk (*) and MAY
617 generate any of the other commands listed in Table 13.

618

619 **Table 13 – Commands generated by an on/off light switch**

Cluster	Identifier	Name	On receipt of	Permitted transmissions
Identify (S)	0x00	Identify query response*	Identify query	U--
Identify (C)	0x00	Identify	-	UGB
Identify (C)	0x01	Identify query*	-	UGB
Identify (C)	0x40	Trigger effect	-	UGB
On/off (C)	0x00	Off	-	UGB
On/off (C)	0x01	On	-	UGB
On/off (C)	0x02	Toggle	-	UGB
On/off (C)	0x40	Off with effect	-	UGB
On/off (C)	0x41	On with recall global scene	-	UGB
On/off (C)	0x42	On with timed off	-	UGB

620

621 9.3 PICS

622 The following PICS SHALL be supported for this device. Note that a device MAY support other
623 optional PICS items.

Cluster	PICS
Basic [R6]	B.S B.S.A0000, B.S.A0001, B.S.A0002, B.S.A0003, B.S.A0004, B.S.A0005, B.S.A0006, B.S.A0007, B.S.A0008, B.S.A0009, B.S.A000a, B.S.A000b, B.S.A4000, B.S.Afffd
Identify [R7]	I.S, I.C I.S.A0000, I.S.Afffd, I.C.Afffd I.S.C00.Rsp, I.S.C01.Rsp, I.S.C40.Rsp I.S.C00.Tx, I.C.C01.Tx
On/off [R10]	OO.C OO.C.Afffd

624

10 Dimmer switch

The dimmer switch is a controller device that, when bound to a lighting device such as a dimmable light, can be used to switch the device on or off and adjust the intensity of the light being emitted. The dimmer switch may also be configured when bound to a suitable configuration device.

10.1 Device configuration

When the dimmer switch device type is implemented on an endpoint, the following configurations apply:

- The *application device version* field of the corresponding simple descriptor SHALL be set to 0x1.
- The device class SHALL be *simple*.
- The device SHALL implement a finding & binding *initiator*.

10.2 Supported clusters

The dimmer switch device SHALL support the mandatory clusters and MAY support the recommended optional clusters listed in Figure 5.

	Dimmer switch [Device ID: 0x0104]	
	Server clusters	**Client clusters**
Mandatory	0x0000: Basic	Identify: 0x0003
	0x0003: Identify	On/off: 0x0006
		Level control: 0x0008
Recommended optional	*0x0007: On/off switch configuration*	*Groups: 0x0004*
		Scenes: 0x0005
		OTA upgrade: 0x0019

Figure 5 – Clusters supported by the dimmer switch device type

10.2.1 Required attributes

A dimmer switch device SHALL support the attributes listed in Table 14.

Table 14 – Mandatory attributes for a dimmer switch

Cluster	Identifier	Name	Scene table	Reportable
Basic (S)	0x0000	ZCLVersion	×	-
Basic (S)	0x0001	ApplicationVersion	×	-
Basic (S)	0x0002	StackVersion	×	-
Basic (S)	0x0003	HWVersion	×	-
Basic (S)	0x0004	ManufacturerName	×	-
Basic (S)	0x0005	ModelIdentifier	×	-
Basic (S)	0x0006	DateCode	×	-
Basic (S)	0x0007	PowerSource	×	-

Cluster	Identifier	Name	Scene table	Reportable
Basic (S)	0x0008	GenericDeviceClass	✖	-
Basic (S)	0x0009	GenericDeviceType	✖	-
Basic (S)	0x000a	ProductCode	✖	-
Basic (S)	0x000b	ProductURL	✖	-
Basic (S)	0x4000	SWBuildID	✖	-
Identify (S)	0x0000	IdentifyTime	✖	-
All supported clusters (S&C)	0xfffd	ClusterRevision	✖	-

10.2.2 Required commands received

A dimmer switch device SHALL be able to receive and process the commands listed in Table 15.

Table 15 – Mandatory commands received by a dimmer switch

Cluster	Identifier	Name
Identify (S)	0x00	Identify
Identify (S)	0x01	Identify query
Identify (S)	0x40	Trigger effect

10.2.3 Commands generated

A dimmer switch device SHALL generate the commands indicated with an asterisk (*) and MAY generate any of the other commands listed in Table 16.

Table 16 – Commands generated by a dimmer switch

Cluster	Identifier	Name	On receipt of	Permitted transmissions
Identify (S)	0x00	Identify query response*	Identify query	U--
Identify (C)	0x00	Identify	-	UGB
Identify (C)	0x01	Identify query*	-	UGB
Identify (C)	0x40	Trigger effect	-	UGB
On/off (C)	0x00	Off	-	UGB
On/off (C)	0x01	On	-	UGB
On/off (C)	0x02	Toggle	-	UGB
On/off (C)	0x40	Off with effect	-	UGB
On/off (C)	0x41	On with recall global scene	-	UGB
On/off (C)	0x42	On with timed off	-	UGB

Cluster	Identifier	Name	On receipt of	Permitted transmissions
Level control (C)	0x00	Move to level	-	UGB
Level control (C)	0x01	Move	-	UGB
Level control (C)	0x02	Step	-	UGB
Level control (C)	0x03	Stop	-	UGB
Level control (C)	0x04	Move to level (with on/off)	-	UGB
Level control (C)	0x05	Move (with on/off)	-	UGB
Level control (C)	0x06	Step (with on/off)	-	UGB
Level control (C)	0x07	Stop (with on/off)	-	UGB

656

657

10.3 PICS

The following PICS SHALL be supported for this device. Note that a device MAY support other optional PICS items.

Cluster	PICS
Basic [R6]	B.S B.S.A0000, B.S.A0001, B.S.A0002, B.S.A0003, B.S.A0004, B.S.A0005, B.S.A0006, B.S.A0007, B.S.A0008, B.S.A0009, B.S.A000a, B.S.A000b, B.S.A4000, B.S.Afffd
Identify [R7]	I.S, I.C I.S.A0000, I.S.Afffd, I.C.Afffd I.S.C00.Rsp, I.S.C01.Rsp, I.S.C40.Rsp I.S.C00.Tx, I.C.C01.Tx
On/off [R10]	OO.C OO.C.Afffd
Level Control [R11]	LC.C LC.C.Afffd

11 Color dimmer switch

The color dimmer switch is a controller device that, when bound to a lighting device such as a color light, can be used to adjust the color of the light being emitted. The color dimmer switch may also be configured when bound to a suitable configuration device.

11.1 Device configuration

When the color dimmer switch device type is implemented on an endpoint, the following configurations apply:

- The *application device version* field of the corresponding simple descriptor SHALL be set to 0x1.
- The device class SHALL be *simple*.
- The device SHALL implement a finding & binding *initiator*.

11.2 Supported clusters

The color dimmer switch device SHALL support the mandatory clusters and MAY support the recommended optional clusters listed in Figure 6.

	Color dimmer switch [Device ID: 0x0105]	
	Server clusters	**Client clusters**
Mandatory	0x0000: Basic	Identify: 0x0003
	0x0003: Identify	On/off: 0x0006
		Level control: 0x0008
		Color control: 0x0300
Recommended optional	*0x0007: On/off switch configuration*	*Groups: 0x0004*
		Scenes: 0x0005
		OTA upgrade: 0x0019

Figure 6 – Clusters supported by the color dimmer switch device type

11.2.1 Required attributes

A color dimmer switch device SHALL support the attributes listed in Table 17.

Table 17 – Mandatory attributes for a color dimmer switch

Cluster	Identifier	Name	Scene table	Reportable
Basic (S)	0x0000	ZCLVersion	✖	-
Basic (S)	0x0001	ApplicationVersion	✖	-
Basic (S)	0x0002	StackVersion	✖	-
Basic (S)	0x0003	HWVersion	✖	-
Basic (S)	0x0004	ManufacturerName	✖	-
Basic (S)	0x0005	ModelIdentifier	✖	-
Basic (S)	0x0006	DateCode	✖	-

Cluster	Identifier	Name	Scene table	Reportable
Basic (S)	0x0007	PowerSource	×	-
Basic (S)	0x0008	GenericDeviceClass	×	-
Basic (S)	0x0009	GenericDeviceType	×	-
Basic (S)	0x000a	ProductCode	×	-
Basic (S)	0x000b	ProductURL	×	-
Basic (S)	0x4000	SWBuildID	×	-
Identify (S)	0x0000	IdentifyTime	×	-
All supported clusters (S&C)	0xfffd	ClusterRevision	×	-

11.2.2 Required commands received

A color dimmer switch device SHALL be able to receive and process the commands listed in Table 18.

Table 18 – Mandatory commands received by a color dimmer switch

Cluster	Identifier	Name
Identify (S)	0x00	Identify
Identify (S)	0x01	Identify query
Identify (S)	0x40	Trigger effect

11.2.3 Commands generated

A color dimmer switch device SHALL generate the commands indicated with an asterisk (*) and MAY generate any of the other commands listed in Table 19.

Table 19 – Commands generated by a color dimmer switch

Cluster	Identifier	Name	On receipt of	Permitted transmissions
Identify (S)	0x00	Identify query response*	Identify query	U--
Identify (C)	0x00	Identify	-	UGB
Identify (C)	0x01	Identify query*	-	UGB
Identify (C)	0x40	Trigger effect	-	UGB
On/off (C)	0x00	Off	-	UGB
On/off (C)	0x01	On	-	UGB
On/off (C)	0x02	Toggle	-	UGB
On/off (C)	0x40	Off with effect	-	UGB
On/off (C)	0x41	On with recall global scene	-	UGB

Cluster	Identifier	Name	On receipt of	Permitted transmissions
On/off (C)	0x42	On with timed off	-	UGB
Level control (C)	0x00	Move to level	-	UGB
Level control (C)	0x01	Move	-	UGB
Level control (C)	0x02	Step	-	UGB
Level control (C)	0x03	Stop	-	UGB
Level control (C)	0x04	Move to level (with on/off)	-	UGB
Level control (C)	0x05	Move (with on/off)	-	UGB
Level control (C)	0x06	Step (with on/off)	-	UGB
Level control (C)	0x07	Stop (with on/off)	-	UGB
Color control (C)	0x00	Move to hue	-	UGB
Color control (C)	0x01	Move hue	-	UGB
Color control (C)	0x02	Step hue	-	UGB
Color control (C)	0x03	Move to saturation	-	UGB
Color control (C)	0x04	Move saturation	-	UGB
Color control (C)	0x05	Step saturation	-	UGB
Color control (C)	0x06	Move to hue and saturation	-	UGB
Color control (C)	0x07	Move to color	-	UGB
Color control (C)	0x08	Move color	-	UGB
Color control (C)	0x09	Step color	-	UGB
Color control (C)	0x0a	Move to color temperature	-	UGB
Color control (C)	0x40	Enhanced move to hue	-	UGB
Color control (C)	0x41	Enhanced move hue	-	UGB
Color control (C)	0x42	Enhanced step hue	-	UGB
Color control (C)	0x43	Enhanced move to hue and saturation	-	UGB
Color control (C)	0x44	Color loop set	-	UGB
Color control (C)	0x47	Stop move step	-	UGB
Color control (C)	0x4b	Move color temperature	-	UGB
Color control (C)	0x4c	Step color temperature	-	UGB

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11.3 PICS

The following PICS SHALL be supported for this device. Note that a device MAY support other optional PICS items.

Cluster	PICS
Basic [R6]	B.S B.S.A0000, B.S.A0001, B.S.A0002, B.S.A0003, B.S.A0004, B.S.A0005, B.S.A0006, B.S.A0007, B.S.A0008, B.S.A0009, B.S.A000a, B.S.A000b, B.S.A4000, B.S.Afffd
Identify [R7]	I.S, I.C I.S.A0000, I.S.Afffd, I.C.Afffd I.S.C00.Rsp, I.S.C01.Rsp, I.S.C40.Rsp I.S.C00.Tx, I.C.C01.Tx
On/off [R10]	OO.C OO.C.Afffd
Level Control [R11]	LC.C LC.C.Afffd
Color Control [R12]	CC.C CC.C.Afffd

12 Light sensor

The light sensor is a measurement & sensing device that can measure and report the intensity of light being emitted by a light source.

12.1 Device configuration

When the light sensor device type is implemented on an endpoint, the following configurations apply:

- The *application device version* field of the corresponding simple descriptor SHALL be set to 0x1.
- The device class SHALL be *simple*.
- The device SHALL implement a finding & binding *initiator*.

12.2 Supported clusters

The light sensor device SHALL support the mandatory clusters and MAY support the recommended optional clusters listed in Figure 7.

	Light sensor [Device ID: 0x0106]	
	Server clusters	**Client clusters**
Mandatory	0x0000: Basic	Identify: 0x0003
	0x0003: Identify	
	0x0400: Illuminance measurement	
Recommended optional	*None*	*Groups: 0x0004*
		OTA upgrade: 0x0019

Figure 7 – Clusters supported by the light sensor device type

12.2.1 Required attributes

A light sensor device SHALL support the attributes listed in Table 20.

Table 20 – Mandatory attributes for a light sensor

Cluster	Identifier	Name	Scene table	Reportable
Basic (S)	0x0000	ZCLVersion	×	-
Basic (S)	0x0001	ApplicationVersion	×	-
Basic (S)	0x0002	StackVersion	×	-
Basic (S)	0x0003	HWVersion	×	-
Basic (S)	0x0004	ManufacturerName	×	-
Basic (S)	0x0005	ModelIdentifier	×	-
Basic (S)	0x0006	DateCode	×	-
Basic (S)	0x0007	PowerSource	×	-
Basic (S)	0x0008	GenericDeviceClass	×	-
Basic (S)	0x0009	GenericDeviceType	×	-

Cluster	Identifier	Name	Scene table	Reportable
Basic (S)	0x000a	ProductCode	✗	-
Basic (S)	0x000b	ProductURL	✗	-
Basic (S)	0x4000	SWBuildID	✗	-
Identify (S)	0x0000	IdentifyTime	✗	-
Illuminance measurement (S)	0x0000	MeasuredValue	✗	✓
Illuminance measurement (S)	0x0001	MinMeasuredValue	✗	-
Illuminance measurement (S)	0x0002	MaxMeasuredValue	✗	-
All supported clusters (S&C)	0xfffd	ClusterRevision	✗	-

12.2.2 Required commands received

A light sensor device SHALL be able to receive and process the commands listed in Table 21.

Table 21 – Mandatory commands received by a light sensor

Cluster	Identifier	Name
Identify (S)	0x00	Identify
Identify (S)	0x01	Identify query
Identify (S)	0x40	Trigger effect

12.2.3 Commands generated

A light sensor device SHALL generate the commands indicated with an asterisk (*) and MAY generate any of the other commands listed in Table 22.

Table 22 – Commands generated by a light sensor

Cluster	Identifier	Name	On receipt of	Permitted transmissions
Identify (S)	0x00	Identify query response*	Identify query	U--
Identify (C)	0x00	Identify	-	UGB
Identify (C)	0x01	Identify query*	-	UGB
Identify (C)	0x40	Trigger effect	-	UGB

12.3 PICS

The following PICS SHALL be supported for this device. Note that a device MAY support other optional PICS items.

Cluster	PICS
Basic [R6]	B.S B.S.A0000, B.S.A0001, B.S.A0002, B.S.A0003, B.S.A0004, B.S.A0005, B.S.A0006, B.S.A0007, B.S.A0008, B.S.A0009, B.S.A000a, B.S.A000b, B.S.A4000, B.S.Afffd
Identify [R7]	I.S, I.C I.S.A0000, I.S.Afffd, I.C.Afffd I.S.C00.Rsp, I.S.C01.Rsp, I.S.C40.Rsp I.S.C00.Tx, I.C.C01.Tx
Illuminance Measurement [R13]	IM.S IM.S.A0000, IM.S.A0001, IM.S.A0002, IM.S.Afffd

13 Occupancy sensor

The occupancy sensor is a measurement & sensing device that can measure and report the occupancy state within some area.

13.1 Device configuration

When the occupancy sensor device type is implemented on an endpoint, the following configurations apply:

- The *application device version* field of the corresponding simple descriptor SHALL be set to 0x1.
- The device class SHALL be *simple*.
- The device SHALL implement a finding & binding *initiator*.

13.2 Supported clusters

The occupancy sensor device SHALL support the mandatory clusters and MAY support the recommended optional clusters listed in Figure 8.

	Occupancy sensor [Device ID: 0x0107]	
	Server clusters	**Client clusters**
Mandatory	0x0000: Basic	Identify: 0x0003
	0x0003: Identify	
	0x0406: Occupancy sensing	
Recommended optional	*None*	*Groups: 0x0004*
		OTA upgrade: 0x0019

Figure 8 – Clusters supported by the occupancy sensor device type

13.2.1 Required attributes

An occupancy sensor device SHALL support the attributes listed in Table 23.

Table 23 – Mandatory attributes for an occupancy sensor

Cluster	Identifier	Name	Scene table	Reportable
Basic (S)	0x0000	ZCLVersion	×	-
Basic (S)	0x0001	ApplicationVersion	×	-
Basic (S)	0x0002	StackVersion	×	-
Basic (S)	0x0003	HWVersion	×	-
Basic (S)	0x0004	ManufacturerName	×	-
Basic (S)	0x0005	ModelIdentifier	×	-
Basic (S)	0x0006	DateCode	×	-
Basic (S)	0x0007	PowerSource	×	-
Basic (S)	0x0008	GenericDeviceClass	×	-

Cluster	Identifier	Name	Scene table	Reportable
Basic (S)	0x0009	GenericDeviceType	×	-
Basic (S)	0x000a	ProductCode	×	-
Basic (S)	0x000b	ProductURL	×	-
Basic (S)	0x4000	SWBuildID	×	-
Identify (S)	0x0000	IdentifyTime	×	-
Occupancy sensing (S)	0x0000	Occupancy	×	✓
Occupancy sensing (S)	0x0001	OccupancySensorType	×	-
All supported clusters (S&C)	0xfffd	ClusterRevision	×	-

13.2.2 Required commands received

An occupancy sensor device SHALL be able to receive and process the commands listed in Table 24.

Table 24 – Mandatory commands received by an occupancy sensor

Cluster	Identifier	Name
Identify (S)	0x00	Identify
Identify (S)	0x01	Identify query
Identify (S)	0x40	Trigger effect

13.2.3 Commands generated

An occupancy sensor device SHALL generate the commands indicated with an asterisk (*) and MAY generate any of the other commands listed in Table 25.

Table 25 – Commands generated by an occupancy sensor

Cluster	Identifier	Name	On receipt of	Permitted transmissions
Identify (S)	0x00	Identify query response*	Identify query	U--
Identify (C)	0x00	Identify	-	UGB
Identify (C)	0x01	Identify query*	-	UGB
Identify (C)	0x40	Trigger effect	-	UGB

13.3 PICS

The following PICS SHALL be supported for this device. Note that a device MAY support other optional PICS items.

Cluster	PICS
Basic [R6]	B.S B.S.A0000, B.S.A0001, B.S.A0002, B.S.A0003, B.S.A0004, B.S.A0005, B.S.A0006, B.S.A0007, B.S.A0008, B.S.A0009, B.S.A000a, B.S.A000b, B.S.A4000, B.S.Afffd
Identify [R7]	I.S, I.C I.S.A0000, I.S.Afffd, I.C.Afffd I.S.C00.Rsp, I.S.C01.Rsp, I.S.C40.Rsp I.S.C00.Tx, I.C.C01.Tx
Occupancy Sensing [R14]	OS.S OS.S.A0000, OS.S.A0001, OS.S.Afffd

14 On/off ballast

The on/off ballast is a lighting device that can be switched on or off via a bound controller device such as an on/off light switch. The device can be fully configured when bound to a suitable configuration device. In addition, it may also be switched via a bound occupancy sensor.

14.1 Device configuration

When the on/off ballast device type is implemented on an endpoint, the following configurations apply:

- The *application device version* field of the corresponding simple descriptor SHALL be set to 0x1.
- The device class SHALL be *simple*.
- The device SHALL implement a finding & binding *target*.

14.2 Supported clusters

The on/off ballast device SHALL support the mandatory clusters and MAY support the recommended optional clusters listed in Figure 9.

	On/off ballast [Device ID: 0x0108]	
	Server clusters	**Client clusters**
Mandatory	0x0000: Basic	*None*
	0x0001: Power configuration	
	0x0002: Device temperature configuration	
	0x0003: Identify	
	0x0004: Groups	
	0x0005: Scenes	
	0x0006: On/off	
	0x0301: Ballast configuration	
Recommended optional	*0x0008: Level control*	*OTA upgrade: 0x0019*
	0x0401: Illuminance level sensing	*Illuminance measurement: 0x0400*
	0x1000: Touchlink commissioning	*Illuminance level sensing: 0x0401*
		Occupancy sensing: 0x0406

Figure 9 – Clusters supported by the on/off ballast device type

For this device, since its only states are on or off, if the *level control* cluster is implemented, it SHALL not have any effect on the actual light level except for those commands that cause an on/off state change, i.e. the "with on/off" commands. The device SHALL accept and process *level control* cluster commands, adjusting the value of the *CurrentLevel* attribute accordingly and, where necessary, adjusting the *on/off* cluster *OnOff* attribute as described in [R1]. The inclusion of the *level control* cluster on this device is required to provide a consistent user experience when the device is grouped with additional dimmable lights and the "with on/off" commands are used.

14.2.1 Required attributes

An on/off ballast device SHALL support the attributes listed in Table 26.

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798 **Table 26 – Mandatory attributes for an on/off ballast**

Cluster	Identifier	Name	Scene table	Reportable
Basic (S)	0x0000	ZCLVersion	×	-
Basic (S)	0x0001	ApplicationVersion	×	-
Basic (S)	0x0002	StackVersion	×	-
Basic (S)	0x0003	HWVersion	×	-
Basic (S)	0x0004	ManufacturerName	×	-
Basic (S)	0x0005	ModelIdentifier	×	-
Basic (S)	0x0006	DateCode	×	-
Basic (S)	0x0007	PowerSource	×	-
Basic (S)	0x0008	GenericDeviceClass	×	-
Basic (S)	0x0009	GenericDeviceType	×	-
Basic (S)	0x000a	ProductCode	×	-
Basic (S)	0x000b	ProductURL	×	-
Basic (S)	0x4000	SWBuildID	×	-
Identify (S)	0x0000	IdentifyTime	×	-
Groups (S)	0x0000	NameSupport	×	-
Device temperature configuration (S)	0x0000	CurrentTemperature	×	-
Scenes (S)	0x0000	SceneCount	×	-
Scenes (S)	0x0001	CurrentScene	×	-
Scenes (S)	0x0002	CurrentGroup	×	-
Scenes (S)	0x0003	SceneValid	×	-
Scenes (S)	0x0004	NameSupport	×	-
On/off (S)	0x0000	OnOff	✓	✓
On/off (S)	0x4000	GlobalSceneControl	×	-
On/off (S)	0x4001	OnTime	×	-
On/off (S)	0x4002	OffWaitTime	×	-
On/off (S)	0x4003	StartUpOnOff	×	-
Ballast configuration (S)	0x0002	BallastStatus	×	-
All supported clusters (S&C)	0xfffd	ClusterRevision	×	-

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In addition, an on/off ballast device SHALL support either or both the *mains information* OR the *battery information* attributes sets of the power configuration cluster.

14.2.2 Required commands received

An on/off ballast device SHALL be able to receive and process the commands listed in Table 27.

Table 27 – Mandatory commands received by an on/off ballast

Cluster	Identifier	Name
Identify (S)	0x00	Identify
Identify (S)	0x01	Identify query
Identify (S)	0x40	Trigger effect
Groups (S)	0x00	Add group
Groups (S)	0x01	View group
Groups (S)	0x02	Get group membership
Groups (S)	0x03	Remove group
Groups (S)	0x04	Remove all groups
Groups (S)	0x05	Add group if identifying
Scenes (S)	0x00	Add scene
Scenes (S)	0x01	View scene
Scenes (S)	0x02	Remove scene
Scenes (S)	0x03	Remove all scenes
Scenes (S)	0x04	Store scene
Scenes (S)	0x05	Recall scene
Scenes (S)	0x06	Get scene membership
Scenes (S)	0x40	Enhanced add scene
Scenes (S)	0x41	Enhanced view scene
Scenes (S)	0x42	Copy scene
On/off (S)	0x00	Off
On/off (S)	0x01	On
On/off (S)	0x02	Toggle
On/off (S)	0x40	Off with effect
On/off (S)	0x41	On with recall global scene
On/off (S)	0x42	On with timed off

14.2.3 Required commands generated

An on/off ballast device SHALL be able to generate the commands listed in Table 28.

810 **Table 28 – Mandatory commands generated by an on/off ballast**

Cluster	Identifier	Name	On receipt of	Permitted transmissions
Identify (S)	0x00	Identify query response	Identify query	U--
Groups (S)	0x00	Add group response	Add group	U--
Groups (S)	0x01	View group response	View group	U--
Groups (S)	0x02	Get group membership response	Get group membership	U--
Groups (S)	0x03	Remove group response	Remove group	U--
Scenes (S)	0x00	Add scene response	Add scene	U--
Scenes (S)	0x01	View scene response	View scene	U--
Scenes (S)	0x02	Remove scene response	Remove scene	U--
Scenes (S)	0x03	Remove all scenes response	Remove all scenes	U--
Scenes (S)	0x04	Store scene response	Store scene	U--
Scenes (S)	0x06	Get scene membership response	Get scene membership	U--
Scenes (S)	0x40	Enhanced add scene response	Enhanced add scene	U--
Scenes (S)	0x41	Enhanced view scene response	Enhanced view scene	U--
Scenes (S)	0x42	Copy scene response	Copy scene	U--

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14.3 PICS

The following PICS items SHALL be supported for this device. Note that a device MAY support other optional PICS items.

Cluster	PICS item
Basic [R6]	B.S B.S.A0000, B.S.A0001, B.S.A0002, B.S.A0003, B.S.A0004, B.S.A0005, B.S.A0006, B.S.A0007, B.S.A0008, B.S.A0009, B.S.A000a, B.S.A000b, B.S.A4000, B.S.Afffd
Power Configuration	PC.S
Device Temperature Configuration	DTC.S DTC.S.A0000, DTC.S.Afffd
Identify [R7]	I.S I.S.A0000, I.S.Afffd I.S.C00.Rsp, I.S.C01.Rsp, I.S.C40.Rsp I.S.C00.Tx
Groups [R8]	G.S G.S.A0000, G.S.Afffd G.S.C00.Rsp, G.S.C01.Rsp, G.S.C02.Rsp, G.S.C03.Rsp, G.S.C04.Rsp, G.S.C05.Rsp G.S.C00.Tx, G.S.C01.Tx, G.S.C02.Tx, G.S.C03.Tx
Scenes [R9]	S.S S.S.A0000, S.S.A0001, S.S.A0002, S.S.A0003, S.S.A0004, S.S.Afffd S.S.C00.Rsp, S.S.C01.Rsp, S.S.C02.Rsp, S.S.C03.Rsp, S.S.C04.Rsp, S.S.C05.Rsp, S.S.C06.Rsp, S.S.C40.Rsp, S.S.C41.Rsp, S.S.C42.Rsp S.S.C00.Tx, S.S.C01.Tx, S.S.C02.Tx, S.S.C03.Tx, S.S.C04.Tx, S.S.C06.Tx, S.S.C40.Tx, S.S.C41.Tx, S.S.C42.Tx
On/off [R10]	OO.S OO.S.A0000, OO.S.A4000, OO.S.A4001, OO.S.A4002, OO.S.A4003, OO.S.Afffd OO.S.C00.Rsp, OO.S.C01.Rsp, OO.S.C02.Rsp, OO.S.C40.Rsp, OO.S.C41.Rsp, OO.S.C42.Rsp
Ballast Configuration	BC.S BC.S.A0002, BC.S.Afffd

15 Dimmable ballast

The dimmable ballast is a lighting device that can be switched on or off and the intensity of its light adjusted via a bound controller device such as a dimmer switch. The device can be fully configured when bound to a suitable configuration device. In addition, it may also be switched via a bound occupancy sensor.

15.1 Device configuration

When the dimmable ballast device type is implemented on an endpoint, the following configurations apply:

- The *application device version* field of the corresponding simple descriptor SHALL be set to 0x1.
- The device class SHALL be *simple*.
- The device SHALL implement a finding & binding *target*.
- The minimum light level SHALL be 0x01 and the maximum light level SHALL be 0xfe.

15.2 Supported clusters

The dimmable ballast device SHALL support the mandatory clusters and MAY support the recommended optional clusters listed in Figure 10.

	Dimmable ballast [Device ID: 0x0109]	
	Server clusters	**Client clusters**
Mandatory	0x0000: Basic	*None*
	0x0001: Power configuration	
	0x0002: Device temperature configuration	
	0x0003: Identify	
	0x0004: Groups	
	0x0005: Scenes	
	0x0006: On/off	
	0x0008: Level control	
	0x0301: Ballast configuration	
Recommended optional	*0x0401: Illuminance level sensing*	*OTA upgrade: 0x0019*
	0x1000: Touchlink commissioning	*Illuminance measurement: 0x0400*
		Illuminance level sensing: 0x0401
		Occupancy sensing: 0x0406

Figure 10 – Clusters supported by the dimmable ballast device type

15.2.1 Required attributes

A dimmable ballast device SHALL support the attributes listed in Table 29.

838 **Table 29 – Mandatory attributes for a dimmable ballast**

Cluster	Identifier	Name	Scene table	Reportable
Basic (S)	0x0000	ZCLVersion	×	-
Basic (S)	0x0001	ApplicationVersion	×	-
Basic (S)	0x0002	StackVersion	×	-
Basic (S)	0x0003	HWVersion	×	-
Basic (S)	0x0004	ManufacturerName	×	-
Basic (S)	0x0005	ModelIdentifier	×	-
Basic (S)	0x0006	DateCode	×	-
Basic (S)	0x0007	PowerSource	×	-
Basic (S)	0x0008	GenericDeviceClass	×	-
Basic (S)	0x0009	GenericDeviceType	×	-
Basic (S)	0x000a	ProductCode	×	-
Basic (S)	0x000b	ProductURL	×	-
Basic (S)	0x4000	SWBuildID	×	-
Identify (S)	0x0000	IdentifyTime	×	-
Groups (S)	0x0000	NameSupport	×	-
Device temperature configuration (S)	0x0000	CurrentTemperature	×	-
Scenes (S)	0x0000	SceneCount	×	-
Scenes (S)	0x0001	CurrentScene	×	-
Scenes (S)	0x0002	CurrentGroup	×	-
Scenes (S)	0x0003	SceneValid	×	-
Scenes (S)	0x0004	NameSupport	×	-
On/off (S)	0x0000	OnOff	✓	✓
On/off (S)	0x4000	GlobalSceneControl	×	-
On/off (S)	0x4001	OnTime	×	-
On/off (S)	0x4002	OffWaitTime	×	-
On/off (S)	0x4003	StartUpOnOff	×	-
Level control (S)	0x0000	CurrentLevel	✓	✓
Level control (S)	0x0001	RemainingTime	×	-
Level control (S)	0x000f	Options	×	-
Level control (S)	0x4000	StartUpCurrentLevel	×	-
Ballast configuration (S)	0x0002	BallastStatus	×	-

Cluster	Identifier	Name	Scene table	Reportable
All supported clusters (S&C)	0xfffd	ClusterRevision	✖	-

In addition, an on/off ballast device SHALL support either or both the *mains information* OR the *battery information* attributes sets of the power configuration cluster.

15.2.2 Required commands received

A dimmable ballast device SHALL be able to receive and process the commands listed in Table 30.

Table 30 – Mandatory commands received by a dimmable ballast

Cluster	Identifier	Name
Identify (S)	0x00	Identify
Identify (S)	0x01	Identify query
Identify (S)	0x40	Trigger effect
Groups (S)	0x00	Add group
Groups (S)	0x01	View group
Groups (S)	0x02	Get group membership
Groups (S)	0x03	Remove group
Groups (S)	0x04	Remove all groups
Groups (S)	0x05	Add group if identifying
Scenes (S)	0x00	Add scene
Scenes (S)	0x01	View scene
Scenes (S)	0x02	Remove scene
Scenes (S)	0x03	Remove all scenes
Scenes (S)	0x04	Store scene
Scenes (S)	0x05	Recall scene
Scenes (S)	0x06	Get scene membership
Scenes (S)	0x40	Enhanced add scene
Scenes (S)	0x41	Enhanced view scene
Scenes (S)	0x42	Copy scene
On/off (S)	0x00	Off
On/off (S)	0x01	On
On/off (S)	0x02	Toggle
On/off (S)	0x40	Off with effect
On/off (S)	0x41	On with recall global scene
On/off (S)	0x42	On with timed off
Level control (S)	0x00	Move to level

Cluster	Identifier	Name
Level control (S)	0x01	Move
Level control (S)	0x02	Step
Level control (S)	0x03	Stop
Level control (S)	0x04	Move to level (with on/off)
Level control (S)	0x05	Move (with on/off)
Level control (S)	0x06	Step (with on/off)
Level control (S)	0x07	Stop (with on/off)

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847 15.2.3 Required commands generated

848 A dimmable ballast device SHALL be able to generate the commands listed in Table 31.

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850 **Table 31 – Mandatory commands generated by a dimmable ballast**

Cluster	Identifier	Name	On receipt of	Permitted transmissions
Identify (S)	0x00	Identify query response	Identify query	U--
Groups (S)	0x00	Add group response	Add group	U--
Groups (S)	0x01	View group response	View group	U--
Groups (S)	0x02	Get group membership response	Get group membership	U--
Groups (S)	0x03	Remove group response	Remove group	U--
Scenes (S)	0x00	Add scene response	Add scene	U--
Scenes (S)	0x01	View scene response	View scene	U--
Scenes (S)	0x02	Remove scene response	Remove scene	U--
Scenes (S)	0x03	Remove all scenes response	Remove all scenes	U--
Scenes (S)	0x04	Store scene response	Store scene	U--
Scenes (S)	0x06	Get scene membership response	Get scene membership	U--
Scenes (S)	0x40	Enhanced add scene response	Enhanced add scene	U--
Scenes (S)	0x41	Enhanced view scene response	Enhanced view scene	U--
Scenes (S)	0x42	Copy scene response	Copy scene	U--

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15.3 PICS

The following PICS items SHALL be supported for this device. Note that a device MAY support other optional PICS items.

Cluster	PICS item
Basic [R6]	B.S B.S.A0000, B.S.A0001, B.S.A0002, B.S.A0003, B.S.A0004, B.S.A0005, B.S.A0006, B.S.A0007, B.S.A0008, B.S.A0009, B.S.A000a, B.S.A000b, B.S.A4000, B.S.Afffd
Power Configuration	PC.S
Device Temperature Configuration	DTC.S DTC.S.A0000, DTC.S.Afffd
Identify [R7]	I.S I.S.A0000, I.S.Afffd I.S.C00.Rsp, I.S.C01.Rsp, I.S.C40.Rsp I.S.C00.Tx
Groups [R8]	G.S G.S.A0000, G.S.Afffd G.S.C00.Rsp, G.S.C01.Rsp, G.S.C02.Rsp, G.S.C03.Rsp, G.S.C04.Rsp, G.S.C05.Rsp G.S.C00.Tx, G.S.C01.Tx, G.S.C02.Tx, G.S.C03.Tx
Scenes [R9]	S.S S.S.A0000, S.S.A0001, S.S.A0002, S.S.A0003, S.S.A0004, S.S.Afffd S.S.C00.Rsp, S.S.C01.Rsp, S.S.C02.Rsp, S.S.C03.Rsp, S.S.C04.Rsp, S.S.C05.Rsp, S.S.C06.Rsp, S.S.C40.Rsp, S.S.C41.Rsp, S.S.C42.Rsp S.S.C00.Tx, S.S.C01.Tx, S.S.C02.Tx, S.S.C03.Tx, S.S.C04.Tx, S.S.C06.Tx, S.S.C40.Tx, S.S.C41.Tx, S.S.C42.Tx
On/off [R10]	OO.S OO.S.A0000, OO.S.A4000, OO.S.A4001, OO.S.A4002, OO.S.A4003, OO.S.Afffd OO.S.C00.Rsp, OO.S.C01.Rsp, OO.S.C02.Rsp, OO.S.C40.Rsp, OO.S.C41.Rsp, OO.S.C42.Rsp
Level Control [R11]	LC.S LC.S.A0000, LC.S.A0001, LC.S.A000f, LC.S.A4000, LC.S.Afffd LC.S.C00.Rsp, LC.S.C01.Rsp, LC.S.C02.Rsp, LC.S.C03.Rsp, LC.S.C04.Rsp, LC.S.C05.Rsp, LC.S.C06.Rsp, LC.S.C07.Rsp
Ballast Configuration	BC.S BC.S.A0002, BC.S.Afffd

16 On/off plug-in unit

The on/off plug-in unit is a device that can be switched on or off via a bound controller device such as an on/off light switch or a non-color controller. The device may then have a non-ZigBee-enabled light attached to it.

16.1 Device configuration

When the on/off plug-in unit device type is implemented on an endpoint, the following configurations apply:

- The *application device version* field of the corresponding simple descriptor SHALL be set to 0x1.
- The device class SHALL be *simple*.
- The device SHALL implement a finding & binding *target*.

16.2 Supported clusters

The on/off plug-in unit device SHALL support the mandatory clusters and MAY support the recommended optional clusters listed in Figure 11.

	On/off plug-in unit [Device ID: 0x010a]	
	Server clusters	**Client clusters**
Mandatory	0x0000: Basic	*None*
	0x0003: Identify	
	0x0004: Groups	
	0x0005: Scenes	
	0x0006: On/off	
Recommended optional	*0x0008: Level control*	*OTA upgrade: 0x0019*

Figure 11 – Clusters supported by the on/off plug-in unit device type

For this device, since its only states are on or off, if the *level control* cluster is implemented, it SHALL not have any effect on the actual light level except for those commands that cause an on/off state change, i.e. the "with on/off" commands. The device SHALL accept and process *level control* cluster commands, adjusting the value of the *CurrentLevel* attribute accordingly and, where necessary, adjusting the *on/off* cluster *OnOff* attribute as described in [R1]. The inclusion of the *level control* cluster on this device is required to provide a consistent user experience when the device is grouped with additional dimmable lights and the "with on/off" commands are used.

16.2.1 Required attributes

An on/off plug-in unit device SHALL support the attributes listed in Table 32.

Table 32 – Mandatory attributes for an on/off plug-in unit

Cluster	Identifier	Name	Scene table	Reportable
Basic (S)	0x0000	ZCLVersion	✖	-
Basic (S)	0x0001	ApplicationVersion	✖	-

Cluster	Identifier	Name	Scene table	Reportable
Basic (S)	0x0002	StackVersion	×	-
Basic (S)	0x0003	HWVersion	×	-
Basic (S)	0x0004	ManufacturerName	×	-
Basic (S)	0x0005	ModelIdentifier	×	-
Basic (S)	0x0006	DateCode	×	-
Basic (S)	0x0007	PowerSource	×	-
Basic (S)	0x0008	GenericDeviceClass	×	-
Basic (S)	0x0009	GenericDeviceType	×	-
Basic (S)	0x000a	ProductCode	×	-
Basic (S)	0x000b	ProductURL	×	-
Basic (S)	0x4000	SWBuildID	×	-
Identify (S)	0x0000	IdentifyTime	×	-
Groups (S)	0x0000	NameSupport	×	-
Scenes (S)	0x0000	SceneCount	×	-
Scenes (S)	0x0001	CurrentScene	×	-
Scenes (S)	0x0002	CurrentGroup	×	-
Scenes (S)	0x0003	SceneValid	×	-
Scenes (S)	0x0004	NameSupport	×	-
On/off (S)	0x0000	OnOff	✓	✓
On/off (S)	0x4000	GlobalSceneControl	×	-
On/off (S)	0x4001	OnTime	×	-
On/off (S)	0x4002	OffWaitTime	×	-
On/off (S)	0x4003	StartUpOnOff	×	-
All supported clusters (S&C)	0xfffd	ClusterRevision	×	-

16.2.2 Required commands received

An on/off plug-in unit device SHALL be able to receive and process the commands listed in Table 33.

Table 33 – Mandatory commands received by an on/off plug-in unit

Cluster	Identifier	Name
Identify (S)	0x00	Identify
Identify (S)	0x01	Identify query

Cluster	Identifier	Name
Identify (S)	0x40	Trigger effect
Groups (S)	0x00	Add group
Groups (S)	0x01	View group
Groups (S)	0x02	Get group membership
Groups (S)	0x03	Remove group
Groups (S)	0x04	Remove all groups
Groups (S)	0x05	Add group if identifying
Scenes (S)	0x00	Add scene
Scenes (S)	0x01	View scene
Scenes (S)	0x02	Remove scene
Scenes (S)	0x03	Remove all scenes
Scenes (S)	0x04	Store scene
Scenes (S)	0x05	Recall scene
Scenes (S)	0x06	Get scene membership
Scenes (S)	0x40	Enhanced add scene
Scenes (S)	0x41	Enhanced view scene
Scenes (S)	0x42	Copy scene
On/off (S)	0x00	Off
On/off (S)	0x01	On
On/off (S)	0x02	Toggle
On/off (S)	0x40	Off with effect
On/off (S)	0x41	On with recall global scene
On/off (S)	0x42	On with timed off

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892 ### 16.2.3 Required commands generated

893 An on/off plug-in unit device SHALL be able to generate the commands listed in Table 34.

894

895 **Table 34 – Mandatory commands generated by an on/off plug-in unit**

Cluster	Identifier	Name	On receipt of	Permitted transmissions
Identify (S)	0x00	Identify query response	Identify query	U--
Groups (S)	0x00	Add group response	Add group	U--
Groups (S)	0x01	View group response	View group	U--
Groups (S)	0x02	Get group membership response	Get group membership	U--
Groups (S)	0x03	Remove group response	Remove group	U--

Cluster	Identifier	Name	On receipt of	Permitted transmissions
Scenes (S)	0x00	Add scene response	Add scene	U--
Scenes (S)	0x01	View scene response	View scene	U--
Scenes (S)	0x02	Remove scene response	Remove scene	U--
Scenes (S)	0x03	Remove all scenes response	Remove all scenes	U--
Scenes (S)	0x04	Store scene response	Store scene	U--
Scenes (S)	0x06	Get scene membership response	Get scene membership	U--
Scenes (S)	0x40	Enhanced add scene response	Enhanced add scene	U--
Scenes (S)	0x41	Enhanced view scene response	Enhanced view scene	U--
Scenes (S)	0x42	Copy scene response	Copy scene	U--

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16.3 PICS

The following PICS items SHALL be supported for this device. Note that a device MAY support other optional PICS items.

Cluster	PICS item
Basic [R6]	B.S B.S.A0000, B.S.A0001, B.S.A0002, B.S.A0003, B.S.A0004, B.S.A0005, B.S.A0006, B.S.A0007, B.S.A0008, B.S.A0009, B.S.A000a, B.S.A000b, B.S.A4000, B.S.Afffd
Identify [R7]	I.S I.S.A0000, I.S.Afffd I.S.C00.Rsp, I.S.C01.Rsp, I.S.C40.Rsp I.S.C00.Tx
Groups [R8]	G.S G.S.A0000, G.S.Afffd G.S.C00.Rsp, G.S.C01.Rsp, G.S.C02.Rsp, G.S.C03.Rsp, G.S.C04.Rsp, G.S.C05.Rsp G.S.C00.Tx, G.S.C01.Tx, G.S.C02.Tx, G.S.C03.Tx
Scenes [R9]	S.S S.S.A0000, S.S.A0001, S.S.A0002, S.S.A0003, S.S.A0004, S.S.Afffd S.S.C00.Rsp, S.S.C01.Rsp, S.S.C02.Rsp, S.S.C03.Rsp, S.S.C04.Rsp, S.S.C05.Rsp, S.S.C06.Rsp, S.S.C40.Rsp, S.S.C41.Rsp, S.S.C42.Rsp S.S.C00.Tx, S.S.C01.Tx, S.S.C02.Tx, S.S.C03.Tx, S.S.C04.Tx, S.S.C06.Tx, S.S.C40.Tx, S.S.C41.Tx, S.S.C42.Tx
On/off [R10]	OO.S OO.S.A0000, OO.S.A4000, OO.S.A4001, OO.S.A4002, OO.S.A4003, OO.S.Afffd OO.S.C00.Rsp, OO.S.C01.Rsp, OO.S.C02.Rsp, OO.S.C40.Rsp, OO.S.C41.Rsp, OO.S.C42.Rsp

17 Dimmable plug-in unit

The dimmable plug-in unit is a device that can be switched on or off and have its level adjusted via a bound controller device such as a dimmer switch or a non-color controller. The device may then have a non-ZigBee-enable light attached to it.

17.1 Device configuration

When the dimmable plug-in unit device type is implemented on an endpoint, the following configurations apply:

- The *application device version* field of the corresponding simple descriptor SHALL be set to 0x1.
- The device class SHALL be *simple*.
- The device SHALL implement a finding & binding *target*.
- The minimum light level SHALL be 0x01 and the maximum light level SHALL be 0xfe.

17.2 Supported clusters

The dimmable plug-in unit device SHALL support the mandatory clusters and MAY support the recommended optional clusters listed in Figure 12.

	Dimmable plug-in unit [Device ID: 0x010b]	
	Server clusters	**Client clusters**
Mandatory	0x0000: Basic	*None*
	0x0003: Identify	
	0x0004: Groups	
	0x0005: Scenes	
	0x0006: On/off	
	0x0008: Level control	
Recommended optional	*None*	*OTA upgrade: 0x0019*

Figure 12 – Clusters supported by the dimmable plug-in unit device type

17.2.1 Required attributes

A dimmable plug-in unit device SHALL support the attributes listed in Table 35.

Table 35 – Mandatory attributes for a dimmable plug-in unit

Cluster	Identifier	Name	Scene table	Reportable
Basic (S)	0x0000	ZCLVersion	×	-
Basic (S)	0x0001	ApplicationVersion	×	-
Basic (S)	0x0002	StackVersion	×	-
Basic (S)	0x0003	HWVersion	×	-

Cluster	Identifier	Name	Scene table	Reportable
Basic (S)	0x0004	ManufacturerName	×	-
Basic (S)	0x0005	ModelIdentifier	×	-
Basic (S)	0x0006	DateCode	×	-
Basic (S)	0x0007	PowerSource	×	-
Basic (S)	0x0008	GenericDeviceClass	×	-
Basic (S)	0x0009	GenericDeviceType	×	-
Basic (S)	0x000a	ProductCode	×	-
Basic (S)	0x000b	ProductURL	×	-
Basic (S)	0x4000	SWBuildID	×	-
Identify (S)	0x0000	IdentifyTime	×	-
Groups (S)	0x0000	NameSupport	×	-
Scenes (S)	0x0000	SceneCount	×	-
Scenes (S)	0x0001	CurrentScene	×	-
Scenes (S)	0x0002	CurrentGroup	×	-
Scenes (S)	0x0003	SceneValid	×	-
Scenes (S)	0x0004	NameSupport	×	-
On/off (S)	0x0000	OnOff	✓	✓
On/off (S)	0x4000	GlobalSceneControl	×	-
On/off (S)	0x4001	OnTime	×	-
On/off (S)	0x4002	OffWaitTime	×	-
On/off (S)	0x4003	StartUpOnOff	×	-
Level control (S)	0x0000	CurrentLevel	✓	✓
Level control (S)	0x0001	RemainingTime	×	-
Level control (S)	0x000f	Options	×	-
Level control (S)	0x4000	StartUpCurrentLevel	×	-
All supported clusters (S&C)	0xfffd	ClusterRevision	×	-

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926 ### 17.2.2 Required commands received

927 A dimmable plug-in unit device SHALL be able to receive and process the commands listed in Table
928 36.

929

930 **Table 36 – Mandatory commands received by a dimmable plug-in unit**

Cluster	Identifier	Name
Identify (S)	0x00	Identify
Identify (S)	0x01	Identify query
Identify (S)	0x40	Trigger effect
Groups (S)	0x00	Add group
Groups (S)	0x01	View group
Groups (S)	0x02	Get group membership
Groups (S)	0x03	Remove group
Groups (S)	0x04	Remove all groups
Groups (S)	0x05	Add group if identifying
Scenes (S)	0x00	Add scene
Scenes (S)	0x01	View scene
Scenes (S)	0x02	Remove scene
Scenes (S)	0x03	Remove all scenes
Scenes (S)	0x04	Store scene
Scenes (S)	0x05	Recall scene
Scenes (S)	0x06	Get scene membership
Scenes (S)	0x40	Enhanced add scene
Scenes (S)	0x41	Enhanced view scene
Scenes (S)	0x42	Copy scene
On/off (S)	0x00	Off
On/off (S)	0x01	On
On/off (S)	0x02	Toggle
On/off (S)	0x40	Off with effect
On/off (S)	0x41	On with recall global scene
On/off (S)	0x42	On with timed off
Level control (S)	0x00	Move to level
Level control (S)	0x01	Move
Level control (S)	0x02	Step
Level control (S)	0x03	Stop
Level control (S)	0x04	Move to level (with on/off)
Level control (S)	0x05	Move (with on/off)
Level control (S)	0x06	Step (with on/off)
Level control (S)	0x07	Stop (with on/off)

931

17.2.3 Required commands generated

A dimmable plug-in unit device SHALL be able to generate the commands listed in Table 37.

Table 37 – Mandatory commands generated by a dimmable plug-in unit

Cluster	Identifier	Name	On receipt of	Permitted transmissions
Identify (S)	0x00	Identify query response	Identify query	U--
Groups (S)	0x00	Add group response	Add group	U--
Groups (S)	0x01	View group response	View group	U--
Groups (S)	0x02	Get group membership response	Get group membership	U--
Groups (S)	0x03	Remove group response	Remove group	U--
Scenes (S)	0x00	Add scene response	Add scene	U--
Scenes (S)	0x01	View scene response	View scene	U--
Scenes (S)	0x02	Remove scene response	Remove scene	U--
Scenes (S)	0x03	Remove all scenes response	Remove all scenes	U--
Scenes (S)	0x04	Store scene response	Store scene	U--
Scenes (S)	0x06	Get scene membership response	Get scene membership	U--
Scenes (S)	0x40	Enhanced add scene response	Enhanced add scene	U--
Scenes (S)	0x41	Enhanced view scene response	Enhanced view scene	U--
Scenes (S)	0x42	Copy scene response	Copy scene	U--

17.3 PICS

The following PICS SHALL be supported for this device. Note that a device MAY support other optional PICS items.

Cluster	PICS
Basic [R6]	B.S B.S.A0000, B.S.A0001, B.S.A0002, B.S.A0003, B.S.A0004, B.S.A0005, B.S.A0006, B.S.A0007, B.S.A0008, B.S.A0009, B.S.A000a, B.S.A000b, B.S.A4000, B.S.Afffd
Identify [R7]	I.S I.S.A0000, I.S.Afffd I.S.C00.Rsp, I.S.C01.Rsp, I.S.C40.Rsp I.S.C00.Tx
Groups [R8]	G.S G.S.A0000, G.S.Afffd G.S.C00.Rsp, G.S.C01.Rsp, G.S.C02.Rsp, G.S.C03.Rsp, G.S.C04.Rsp, G.S.C05.Rsp G.S.C00.Tx, G.S.C01.Tx, G.S.C02.Tx, G.S.C03.Tx
Scenes [R9]	S.S S.S.A0000, S.S.A0001, S.S.A0002, S.S.A0003, S.S.A0004, S.S.Afffd S.S.C00.Rsp, S.S.C01.Rsp, S.S.C02.Rsp, S.S.C03.Rsp, S.S.C04.Rsp, S.S.C05.Rsp, S.S.C06.Rsp, S.S.C40.Rsp, S.S.C41.Rsp, S.S.C42.Rsp S.S.C00.Tx, S.S.C01.Tx, S.S.C02.Tx, S.S.C03.Tx, S.S.C04.Tx, S.S.C06.Tx, S.S.C40.Tx, S.S.C41.Tx, S.S.C42.Tx
On/off [R10]	OO.S OO.S.A0000, OO.S.A4000, OO.S.A4001, OO.S.A4002, OO.S.A4003, OO.S.Afffd OO.S.C00.Rsp, OO.S.C01.Rsp, OO.S.C02.Rsp, OO.S.C40.Rsp, OO.S.C41.Rsp, OO.S.C42.Rsp
Level Control [R11]	LC.S LC.S.A0000, LC.S.A0001, LC.S.A000f, LC.S.A4000, LC.S.Afffd LC.S.C00.Rsp, LC.S.C01.Rsp, LC.S.C02.Rsp, LC.S.C03.Rsp, LC.S.C04.Rsp, LC.S.C05.Rsp, LC.S.C06.Rsp, LC.S.C07.Rsp

18 Color temperature light

The color temperature light is a lighting device that can be switched on or off, the intensity of its light adjusted and its color adjusted via a bound controller device such as a color controller. The device supports adjustment of color via color temperature.

18.1 Device configuration

When the color temperature device type is implemented on an endpoint, the following configurations apply:

- The *application device version* field of the corresponding simple descriptor SHALL be set to 0x1.
- The device class SHALL be *simple*.
- The device SHALL implement a finding & binding *target*.
- The minimum light level SHALL be 0x01 and the maximum light level SHALL be 0xfe.

18.2 Supported clusters

The color temperature light device SHALL support the mandatory clusters and MAY support the recommended optional clusters listed in Figure 13.

	Color temperature light [Device ID: 0x010c]	
	Server clusters	**Client clusters**
Mandatory	0x0000: Basic	*None*
	0x0003: Identify	
	0x0004: Groups	
	0x0005: Scenes	
	0x0006: On/off	
	0x0008: Level control	
	0x0300: Color control	
Recommended optional	*0x1000: Touchlink commissioning*	*OTA upgrade: 0x0019*

Figure 13 – Clusters supported by the color temperature light device type

18.2.1 Required attributes

A color temperature light device SHALL support the attributes listed in Table 38.

Table 38 – Mandatory attributes for a color temperature light

Cluster	Identifier	Name	Scene table	Reportable
Basic (S)	0x0000	ZCLVersion	✖	-
Basic (S)	0x0001	ApplicationVersion	✖	-
Basic (S)	0x0002	StackVersion	✖	-
Basic (S)	0x0003	HWVersion	✖	-

Cluster	Identifier	Name	Scene table	Reportable
Basic (S)	0x0004	ManufacturerName	×	-
Basic (S)	0x0005	ModelIdentifier	×	-
Basic (S)	0x0006	DateCode	×	-
Basic (S)	0x0007	PowerSource	×	-
Basic (S)	0x0008	GenericDeviceClass	×	-
Basic (S)	0x0009	GenericDeviceType	×	-
Basic (S)	0x000a	ProductCode	×	-
Basic (S)	0x000b	ProductURL	×	-
Basic (S)	0x4000	SWBuildID	×	-
Identify (S)	0x0000	IdentifyTime	×	-
Groups (S)	0x0000	NameSupport	×	-
Scenes (S)	0x0000	SceneCount	×	-
Scenes (S)	0x0001	CurrentScene	×	-
Scenes (S)	0x0002	CurrentGroup	×	-
Scenes (S)	0x0003	SceneValid	×	-
Scenes (S)	0x0004	NameSupport	×	-
On/off (S)	0x0000	OnOff	✓	✓
On/off (S)	0x4000	GlobalSceneControl	×	-
On/off (S)	0x4001	OnTime	×	-
On/off (S)	0x4002	OffWaitTime	×	-
On/off (S)	0x4003	StartUpOnOff	×	-
Level control (S)	0x0000	CurrentLevel	✓	✓
Level control (S)	0x0001	RemainingTime	×	-
Level control (S)	0x000f	Options	×	-
Level control (S)	0x4000	StartUpCurrentLevel	×	-
Color control (S)	0x0002	RemainingTime	×	-
Color control (S)	0x0007	ColorTemperature	✓	✓
Color control (S)	0x0008	ColorMode	×	-
Color control (S)	0x000f	Options	×	-
Color control (S)	0x0010	NumberOfPrimaries[4]	×	-

[4] A device SHALL also support the attributes Primary*i*X, Primary*i*Y and Primary*i*Intensity, where *i* is in the range from 1 to the value of NumberOfPrimaries.

Cluster	Identifier	Name	Scene table	Reportable
Color control (S)	0x4000	EnhancedCurrentHue	✓	-
Color control (S)	0x400a	ColorCapabilities	×	-
Color control (S)	0x400b	ColorTempPhysicalMin	×	-
Color control (S)	0x400c	ColorTempPhysicalMax	×	-
Color control (S)	0x400d	CoupleColorTempToLevelMin-Mireds	×	-
Color control (S)	0x4010	StartUpColorTemperature	×	-
All supported clusters (S&C)	0xfffd	ClusterRevision	×	-

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966 ### 18.2.2 Required commands received

967 A color temperature light device SHALL be able to receive and process the commands listed in Table
968 39.

969

970 **Table 39 – Mandatory commands received by a color temperature light**

Cluster	Identifier	Name
Identify (S)	0x00	Identify
Identify (S)	0x01	Identify query
Identify (S)	0x40	Trigger effect
Groups (S)	0x00	Add group
Groups (S)	0x01	View group
Groups (S)	0x02	Get group membership
Groups (S)	0x03	Remove group
Groups (S)	0x04	Remove all groups
Groups (S)	0x05	Add group if identifying
Scenes (S)	0x00	Add scene
Scenes (S)	0x01	View scene
Scenes (S)	0x02	Remove scene
Scenes (S)	0x03	Remove all scenes
Scenes (S)	0x04	Store scene
Scenes (S)	0x05	Recall scene
Scenes (S)	0x06	Get scene membership
Scenes (S)	0x40	Enhanced add scene
Scenes (S)	0x41	Enhanced view scene
Scenes (S)	0x42	Copy scene
On/off (S)	0x00	Off

Cluster	Identifier	Name
On/off (S)	0x01	On
On/off (S)	0x02	Toggle
On/off (S)	0x40	Off with effect
On/off (S)	0x41	On with recall global scene
On/off (S)	0x42	On with timed off
Level control (S)	0x00	Move to level
Level control (S)	0x01	Move
Level control (S)	0x02	Step
Level control (S)	0x03	Stop
Level control (S)	0x04	Move to level (with on/off)
Level control (S)	0x05	Move (with on/off)
Level control (S)	0x06	Step (with on/off)
Level control (S)	0x07	Stop (with on/off)
Color control (S)	0x0a	Move to color temperature
Color control (S)	0x47	Stop move step
Color control (S)	0x4b	Move color temperature
Color control (S)	0x4c	Step color temperature

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18.2.3 Required commands generated

973 A color temperature light device SHALL be able to generate the commands listed in Table 40.

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975 **Table 40 – Mandatory commands generated by a color temperature light**

Cluster	Identifier	Name	On receipt of	Permitted transmissions
Identify (S)	0x00	Identify query response	Identify query	U--
Groups (S)	0x00	Add group response	Add group	U--
Groups (S)	0x01	View group response	View group	U--
Groups (S)	0x02	Get group membership response	Get group membership	U--
Groups (S)	0x03	Remove group response	Remove group	U--
Scenes (S)	0x00	Add scene response	Add scene	U--
Scenes (S)	0x01	View scene response	View scene	U--
Scenes (S)	0x02	Remove scene response	Remove scene	U--
Scenes (S)	0x03	Remove all scenes response	Remove all scenes	U--

Cluster	Identifier	Name	On receipt of	Permitted transmissions
Scenes (S)	0x04	Store scene response	Store scene	U--
Scenes (S)	0x06	Get scene membership response	Get scene membership	U--
Scenes (S)	0x40	Enhanced add scene response	Enhanced add scene	U--
Scenes (S)	0x41	Enhanced view scene response	Enhanced view scene	U--
Scenes (S)	0x42	Copy scene response	Copy scene	U--

976

977 18.3 Generic usage notes

978 For this device, in the *color control* cluster, the *ColorCapabilities* attribute SHALL be set to 0x0010,
979 indicating support for color temperature.

980

18.4 PICS

The following PICS SHALL be supported for this device. Note that a device MAY support other optional PICS items.

Cluster	PICS
Basic [R6]	B.S B.S.A0000, B.S.A0001, B.S.A0002, B.S.A0003, B.S.A0004, B.S.A0005, B.S.A0006, B.S.A0007, B.S.A0008, B.S.A0009, B.S.A000a, B.S.A000b, B.S.A4000, B.S.Afffd
Identify [R7]	I.S I.S.A0000, I.S.Afffd I.S.C00.Rsp, I.S.C01.Rsp, I.S.C40.Rsp I.S.C00.Tx
Groups [R8]	G.S G.S.A0000, G.S.Afffd G.S.C00.Rsp, G.S.C01.Rsp, G.S.C02.Rsp, G.S.C03.Rsp, G.S.C04.Rsp, G.S.C05.Rsp G.S.C00.Tx, G.S.C01.Tx, G.S.C02.Tx, G.S.C03.Tx
Scenes [R9]	S.S S.S.A0000, S.S.A0001, S.S.A0002, S.S.A0003, S.S.A0004, S.S.Afffd S.S.C00.Rsp, S.S.C01.Rsp, S.S.C02.Rsp, S.S.C03.Rsp, S.S.C04.Rsp, S.S.C05.Rsp, S.S.C06.Rsp, S.S.C40.Rsp, S.S.C41.Rsp, S.S.C42.Rsp S.S.C00.Tx, S.S.C01.Tx, S.S.C02.Tx, S.S.C03.Tx, S.S.C04.Tx, S.S.C06.Tx, S.S.C40.Tx, S.S.C41.Tx, S.S.C42.Tx
On/off [R10]	OO.S OO.S.A0000, OO.S.A4000, OO.S.A4001, OO.S.A4002, OO.S.A4003, OO.S.Afffd OO.S.C00.Rsp, OO.S.C01.Rsp, OO.S.C02.Rsp, OO.S.C40.Rsp, OO.S.C41.Rsp, OO.S.C42.Rsp
Level Control [R11]	LC.S LC.S.A0000, LC.S.A0001, LC.S.A000f, LC.S.A4000, LC.S.Afffd LC.S.C00.Rsp, LC.S.C01.Rsp, LC.S.C02.Rsp, LC.S.C03.Rsp, LC.S.C04.Rsp, LC.S.C05.Rsp, LC.S.C06.Rsp, LC.S.C07.Rsp
Color Control [R12]	CC.S CC.S.A0002, CC.S.A0007, CC.S.A0008, CC.S.A000f, CC.S.A0010, CC.S.A4000, CC.S.A400a, CC.S.A400b, CC.S.A400c, CC.S.A400d, CC.S.Afffd CC.S.C0a.Rsp, CC.S.C47.Rsp, CC.S.C4b.Rsp, CC.S.C4c.Rsp

19 Extended color light

The extended color light is a lighting device that can be switched on or off, the intensity of its light adjusted and its color adjusted via a bound controller device such as a color controller. The device supports adjustment of color via hue/saturation, enhanced hue, color looping, XY coordinates and color temperature. In addition, it may also be switched via a bound occupancy sensor.

19.1 Device configuration

When the extended color light device type is implemented on an endpoint, the following configurations apply:

- The *application device version* field of the corresponding simple descriptor SHALL be set to 0x1.
- The device class SHALL be *simple*.
- The device SHALL implement a finding & binding *target*.
- The minimum light level SHALL be 0x01 and the maximum light level SHALL be 0xfe.

19.2 Supported clusters

The extended color light device SHALL support the mandatory clusters and MAY support the recommended optional clusters listed in Figure 14.

	Extended color light [Device ID: 0x010d]	
	Server clusters	**Client clusters**
Mandatory	0x0000: Basic	*None*
	0x0003: Identify	
	0x0004: Groups	
	0x0005: Scenes	
	0x0006: On/off	
	0x0008: Level control	
	0x0300: Color control	
Recommended optional	*0x1000: Touchlink commissioning*	*OTA upgrade: 0x0019*

Figure 14 – Clusters supported by the extended color light device type

19.2.1 Required attributes

An extended color light device SHALL support the attributes listed in Table 41.

Table 41 – Mandatory attributes for an extended color light

Cluster	Identifier	Name	Scene table	Reportable
Basic (S)	0x0000	ZCLVersion	✖	-
Basic (S)	0x0001	ApplicationVersion	✖	-
Basic (S)	0x0002	StackVersion	✖	-

Cluster	Identifier	Name	Scene table	Reportable
Basic (S)	0x0003	HWVersion	×	-
Basic (S)	0x0004	ManufacturerName	×	-
Basic (S)	0x0005	ModelIdentifier	×	-
Basic (S)	0x0006	DateCode	×	-
Basic (S)	0x0007	PowerSource	×	-
Basic (S)	0x0008	GenericDeviceClass	×	-
Basic (S)	0x0009	GenericDeviceType	×	-
Basic (S)	0x000a	ProductCode	×	-
Basic (S)	0x000b	ProductURL	×	-
Basic (S)	0x4000	SWBuildID	×	-
Identify (S)	0x0000	IdentifyTime	×	-
Groups (S)	0x0000	NameSupport	×	-
Scenes (S)	0x0000	SceneCount	×	-
Scenes (S)	0x0001	CurrentScene	×	-
Scenes (S)	0x0002	CurrentGroup	×	-
Scenes (S)	0x0003	SceneValid	×	-
Scenes (S)	0x0004	NameSupport	×	-
On/off (S)	0x0000	OnOff	✓	✓
On/off (S)	0x4000	GlobalSceneControl	×	-
On/off (S)	0x4001	OnTime	×	-
On/off (S)	0x4002	OffWaitTime	×	-
On/off (S)	0x4003	StartUpOnOff	×	-
Level control (S)	0x0000	CurrentLevel	✓	✓
Level control (S)	0x0001	RemainingTime	×	-
Level control (S)	0x000f	Options	×	-
Level control (S)	0x4000	StartUpCurrentLevel	×	-
Color control (S)	0x0000	CurrentHue	×[5]	✓
Color control (S)	0x0001	CurrentSaturation	✓	✓
Color control (S)	0x0002	RemainingTime	×	-
Color control (S)	0x0003	CurrentX	✓	✓
Color control (S)	0x0004	CurrentY	✓	✓

[5] Note that the *EnhancedCurrentHue* attribute is added to the scene table in favor of the *CurrentHue* attribute.

Cluster	Identifier	Name	Scene table	Reportable
Color control (S)	0x0007	ColorTemperature	✓	✓
Color control (S)	0x0008	ColorMode	×	-
Color control (S)	0x000f	Options	×	-
Color control (S)	0x0010	NumberOfPrimaries[6]	×	-
Color control (S)	0x4000	EnhancedCurrentHue	✓	-
Color control (S)	0x4001	EnhancedColorMode	×	-
Color control (S)	0x4002	ColorLoopActive	✓	-
Color control (S)	0x4003	ColorLoopDirection	✓	-
Color control (S)	0x4004	ColorLoopTime	✓	-
Color control (S)	0x4005	ColorLoopStartEnhancedHue	×	-
Color control (S)	0x4006	ColorLoopStoredEnhancedHue	×	-
Color control (S)	0x400a	ColorCapabilities	×	-
Color control (S)	0x400b	ColorTempPhysicalMin	×	-
Color control (S)	0x400c	ColorTempPhysicalMax	×	-
Color control (S)	0x400d	CoupleColorTempToLevelMin-Mireds	×	-
Color control (S)	0x4010	StartUpColorTemperature	×	-
All supported clusters (S&C)	0xfffd	ClusterRevision	×	-

19.2.2 Required commands received

An extended color light device SHALL be able to receive and process the commands listed in Table 42.

Table 42 – Mandatory commands received by an extended color light

Cluster	Identifier	Name
Identify (S)	0x00	Identify
Identify (S)	0x01	Identify query
Identify (S)	0x40	Trigger effect
Groups (S)	0x00	Add group
Groups (S)	0x01	View group
Groups (S)	0x02	Get group membership

[6] A device SHALL also support the attributes Primary*i*X, Primary*i*Y and Primary*i*Intensity, where *i* is in the range from 1 to the value of NumberOfPrimaries.

Cluster	Identifier	Name
Groups (S)	0x03	Remove group
Groups (S)	0x04	Remove all groups
Groups (S)	0x05	Add group if identifying
Scenes (S)	0x00	Add scene
Scenes (S)	0x01	View scene
Scenes (S)	0x02	Remove scene
Scenes (S)	0x03	Remove all scenes
Scenes (S)	0x04	Store scene
Scenes (S)	0x05	Recall scene
Scenes (S)	0x06	Get scene membership
Scenes (S)	0x40	Enhanced add scene
Scenes (S)	0x41	Enhanced view scene
Scenes (S)	0x42	Copy scene
On/off (S)	0x00	Off
On/off (S)	0x01	On
On/off (S)	0x02	Toggle
On/off (S)	0x40	Off with effect
On/off (S)	0x41	On with recall global scene
On/off (S)	0x42	On with timed off
Level control (S)	0x00	Move to level
Level control (S)	0x01	Move
Level control (S)	0x02	Step
Level control (S)	0x03	Stop
Level control (S)	0x04	Move to level (with on/off)
Level control (S)	0x05	Move (with on/off)
Level control (S)	0x06	Step (with on/off)
Level control (S)	0x07	Stop (with on/off)
Color control (S)	0x00	Move to hue
Color control (S)	0x01	Move hue
Color control (S)	0x02	Step hue
Color control (S)	0x03	Move to saturation
Color control (S)	0x04	Move saturation
Color control (S)	0x05	Step saturation
Color control (S)	0x06	Move to hue and saturation
Color control (S)	0x07	Move to color
Color control (S)	0x08	Move color

Cluster	Identifier	Name
Color control (S)	0x09	Step color
Color control (S)	0x0a	Move to color temperature
Color control (S)	0x40	Enhanced move to hue
Color control (S)	0x41	Enhanced move hue
Color control (S)	0x42	Enhanced step hue
Color control (S)	0x43	Enhanced move to hue and saturation
Color control (S)	0x44	Color loop set
Color control (S)	0x47	Stop move step
Color control (S)	0x4b	Move color temperature
Color control (S)	0x4c	Step color temperature

19.2.3 Required commands generated

An extended color light device SHALL be able to generate the commands listed in Table 43.

Table 43 – Mandatory commands generated by an extended color light

Cluster	Identifier	Name	On receipt of	Permitted transmissions
Identify (S)	0x00	Identify query response	Identify query	U--
Groups (S)	0x00	Add group response	Add group	U--
Groups (S)	0x01	View group response	View group	U--
Groups (S)	0x02	Get group membership response	Get group membership	U--
Groups (S)	0x03	Remove group response	Remove group	U--
Scenes (S)	0x00	Add scene response	Add scene	U--
Scenes (S)	0x01	View scene response	View scene	U--
Scenes (S)	0x02	Remove scene response	Remove scene	U--
Scenes (S)	0x03	Remove all scenes response	Remove all scenes	U--
Scenes (S)	0x04	Store scene response	Store scene	U--
Scenes (S)	0x06	Get scene membership response	Get scene membership	U--
Scenes (S)	0x40	Enhanced add scene response	Enhanced add scene	U--
Scenes (S)	0x41	Enhanced view scene response	Enhanced view scene	U--
Scenes (S)	0x42	Copy scene response	Copy scene	U--

19.3 Generic usage notes

For this device, in the *color control* cluster, the *ColorCapabilities* attribute SHALL be set to 0x001f, indicating support for hue/saturation, enhanced hue, color loop, XY and color temperature.

19.4 PICS

The following PICS SHALL be supported for this device. Note that a device MAY support other optional PICS items.

Cluster	PICS
Basic [R6]	B.S B.S.A0000, B.S.A0001, B.S.A0002, B.S.A0003, B.S.A0004, B.S.A0005, B.S.A0006, B.S.A0007, B.S.A0008, B.S.A0009, B.S.A000a, B.S.A000b, B.S.A4000, B.S.Afffd
Identify [R7]	I.S I.S.A0000, I.S.Afffd I.S.C00.Rsp, I.S.C01.Rsp, I.S.C40.Rsp I.S.C00.Tx
Groups [R8]	G.S G.S.A0000, G.S.Afffd G.S.C00.Rsp, G.S.C01.Rsp, G.S.C02.Rsp, G.S.C03.Rsp, G.S.C04.Rsp, G.S.C05.Rsp G.S.C00.Tx, G.S.C01.Tx, G.S.C02.Tx, G.S.C03.Tx
Scenes [R9]	S.S S.S.A0000, S.S.A0001, S.S.A0002, S.S.A0003, S.S.A0004, S.S.Afffd S.S.C00.Rsp, S.S.C01.Rsp, S.S.C02.Rsp, S.S.C03.Rsp, S.S.C04.Rsp, S.S.C05.Rsp, S.S.C06.Rsp, S.S.C40.Rsp, S.S.C41.Rsp, S.S.C42.Rsp S.S.C00.Tx, S.S.C01.Tx, S.S.C02.Tx, S.S.C03.Tx, S.S.C04.Tx, S.S.C06.Tx, S.S.C40.Tx, S.S.C41.Tx, S.S.C42.Tx
On/off [R10]	OO.S OO.S.A0000, OO.S.A4000, OO.S.A4001, OO.S.A4002, OO.S.A4003, OO.S.Afffd OO.S.C00.Rsp, OO.S.C01.Rsp, OO.S.C02.Rsp, OO.S.C40.Rsp, OO.S.C41.Rsp, OO.S.C42.Rsp
Level Control [R11]	LC.S LC.S.A0000, LC.S.A0001, LC.S.A000f, LC.S.A4000, LC.S.Afffd LC.S.C00.Rsp, LC.S.C01.Rsp, LC.S.C02.Rsp, LC.S.C03.Rsp, LC.S.C04.Rsp, LC.S.C05.Rsp, LC.S.C06.Rsp, LC.S.C07.Rsp
Color Control [R12]	CC.S CC.S.A0000, CC.S.A0001, CC.S.A0002, CC.S.A0003, CC.S.A0004, C.S.A0007, CC.S.A0008, CC.S.A000f, CC.S.A0010, CC.S.A4000, CC.S.A4001, CC.S.A4002, CC.S.A4003, CC.S.A4004, CC.S.A4005, CC.S.A4006, CC.S.A400a, C.S.A400b, CC.S.A400c, CC.S.A400d, CC.S.A4010, CC.S.Afffd CC.S.C00.Rsp, CC.S.C01.Rsp, CC.S.C02.Rsp, CC.S.C03.Rsp, CC.S.C04.Rsp, CC.S.C05.Rsp, CC.S.C06.Rsp, CC.S.C07.Rsp, CC.S.C08.Rsp, CC.S.C09.Rsp, CC.S.C0a.Rsp, CC.S.C40.Rsp, CC.S.C41.Rsp, CC.S.C42.Rsp, CC.S.C43.Rsp, CC.S.C44.Rsp, CC.S.C47.Rsp, CC.S.C4b.Rsp, CC.S.C4c.Rsp

20 Light level sensor

The light level sensor is a measurement and sensing device that, when bound to a lighting device such as an on/off ballast, can be used to switch the device on or off.

20.1 Device configuration

When the light level sensor device type is implemented on an endpoint, the following configurations apply:

- The *application device version* field of the corresponding simple descriptor SHALL be set to 0x1.
- The device class SHALL be *simple*.
- The device SHALL implement a finding & binding *initiator*.

20.2 Supported clusters

The light level sensor device SHALL support the mandatory clusters and MAY support the recommended optional clusters listed in Figure 15.

	Light level sensor [Device ID: 0x010e]	
	Server clusters	**Client clusters**
Mandatory	0x0000: Basic	Identify: 0x0003
	0x0003: Identify	
	0x0401: Illuminance level sensing	
Recommended optional	*None*	*Groups: 0x0004*
		OTA upgrade: 0x0019

Figure 15 – Clusters supported by the light level sensor device type

20.2.1 Required attributes

A light level sensor device SHALL support the attributes listed in Table 44.

Table 44 – Mandatory attributes for a light level sensor

Cluster	Identifier	Name	Scene table	Reportable
Basic (S)	0x0000	ZCLVersion	×	-
Basic (S)	0x0001	ApplicationVersion	×	-
Basic (S)	0x0002	StackVersion	×	-
Basic (S)	0x0003	HWVersion	×	-
Basic (S)	0x0004	ManufacturerName	×	-
Basic (S)	0x0005	ModelIdentifier	×	-
Basic (S)	0x0006	DateCode	×	-
Basic (S)	0x0007	PowerSource	×	-

Cluster	Identifier	Name	Scene table	Reportable
Basic (S)	0x0008	GenericDeviceClass	×	-
Basic (S)	0x0009	GenericDeviceType	×	-
Basic (S)	0x000a	ProductCode	×	-
Basic (S)	0x000b	ProductURL	×	-
Basic (S)	0x4000	SWBuildID	×	-
Identify (S)	0x0000	IdentifyTime	×	-
Illuminance level sensing (S)	0x0000	LevelStatus	×	✓
Illuminance level sensing (S)	0x0010	IlluminanceTargetLevel	×	-
All supported clusters (S&C)	0xfffd	ClusterRevision	×	-

20.2.2 Required commands received

A light level sensor device SHALL be able to receive and process the commands listed in Table 45.

Table 45 – Mandatory commands received by a light level sensor

Cluster	Identifier	Name
Identify (S)	0x00	Identify
Identify (S)	0x01	Identify query
Identify (S)	0x40	Trigger effect

20.2.3 Commands generated

A light level sensor device SHALL generate the commands indicated with an asterisk (*) and MAY generate any of the other commands listed in Table 46.

Table 46 – Commands generated by a light level sensor

Cluster	Identifier	Name	On receipt of	Permitted transmissions
Identify (S)	0x00	Identify query response*	Identify query	U--
Identify (C)	0x00	Identify	-	UGB
Identify (C)	0x01	Identify query*	-	UGB
Identify (C)	0x40	Trigger effect	-	UGB

20.3 PICS

The following PICS SHALL be supported for this device. Note that a device MAY support other optional PICS items.

Cluster	PICS
Basic [R6]	B.S B.S.A0000, B.S.A0001, B.S.A0002, B.S.A0003, B.S.A0004, B.S.A0005, B.S.A0006, B.S.A0007, B.S.A0008, B.S.A0009, B.S.A000a, B.S.A000b, B.S.A4000, B.S.Afffd
Identify [R7]	I.S, I.C I.S.A0000, I.S.Afffd, I.C.Afffd I.S.C00.Rsp, I.S.C01.Rsp, I.S.C40.Rsp I.S.C00.Tx, I.C.C01.Tx
Illuminance Level Sensing	ILS.S ILS.S.A0000, ILS.S.A0010, ILS.S.Afffd

21 Color controller

The color controller is a controller device that, when bound to a lighting device such as a color light, can be used to switch the device on or off, adjust the intensity of the light being emitted and adjust the color of the light being emitted.

21.1 Device configuration

When the color controller device type is implemented on an endpoint, the following configurations apply:

- The *application device version* field of the corresponding simple descriptor SHALL be set to 0x1.
- The device class SHALL be *simple*.
- The device SHALL implement a finding & binding *initiator*.

21.2 Supported clusters

The color controller device SHALL support the mandatory clusters and MAY support the recommended optional clusters listed in Figure 16.

	Color controller [Device ID: 0x0800]	
	Server clusters	**Client clusters**
Mandatory	0x0000: Basic	Identify: 0x0003
	0x0003: Identify	On/off: 0x0006
		Level control: 0x0008
		Color control: 0x0300
Recommended optional	*0x1000: Touchlink commissioning*	*Groups: 0x0004*
		OTA upgrade: 0x0019
		Touchlink commissioning: 0x1000

Figure 16 – Clusters supported by the color controller device type

Note: If the touchlink commissioning cluster is supported on this device then the server side of the utility part of this cluster SHALL be mandatory (see also [R1]).

21.2.1 Required attributes

A color controller device SHALL support the attributes listed in Table 47.

Table 47 – Mandatory attributes for a color controller

Cluster	Identifier	Name	Scene table	Reportable
Basic (S)	0x0000	ZCLVersion	×	-
Basic (S)	0x0001	ApplicationVersion	×	-
Basic (S)	0x0002	StackVersion	×	-
Basic (S)	0x0003	HWVersion	×	-

Cluster	Identifier	Name	Scene table	Reportable
Basic (S)	0x0004	ManufacturerName	×	-
Basic (S)	0x0005	ModelIdentifier	×	-
Basic (S)	0x0006	DateCode	×	-
Basic (S)	0x0007	PowerSource	×	-
Basic (S)	0x0008	GenericDeviceClass	×	-
Basic (S)	0x0009	GenericDeviceType	×	-
Basic (S)	0x000a	ProductCode	×	-
Basic (S)	0x000b	ProductURL	×	-
Basic (S)	0x4000	SWBuildID	×	-
Identify (S)	0x0000	IdentifyTime	×	-
All supported clusters (S&C)	0xfffd	ClusterRevision	×	-

21.2.2 Required commands received

A color controller device SHALL be able to receive and process the commands listed in Table 48.

Table 48 – Mandatory commands received by a color controller

Cluster	Identifier	Name	If generated
Identify (S)	0x00	Identify	-
Identify (S)	0x01	Identify query	-
Identify (S)	0x40	Trigger effect	-
Identify (C)	0x00	Identify query response	Identify query

21.2.3 Required commands generated

A color controller device SHALL generate the commands indicated with an asterisk (*) and MAY generate any of the other commands listed in Table 49.

1099

1100 **Table 49 – Commands generated by a color controller**

Cluster	Identifier	Name	On receipt of	Permitted transmissions
Identify (S)	0x00	Identify query response*	Identify query	U--
Identify (C)	0x00	Identify	-	UGB
Identify (C)	0x01	Identify query*	-	UGB
Identify (C)	0x40	Trigger effect	-	UGB
On/off (C)	0x00	Off	-	UGB
On/off (C)	0x01	On	-	UGB
On/off (C)	0x02	Toggle	-	UGB
On/off (C)	0x40	Off with effect	-	UGB
On/off (C)	0x41	On with recall global scene	-	UGB
On/off (C)	0x42	On with timed off	-	UGB
Level control (C)	0x00	Move to level	-	UGB
Level control (C)	0x01	Move	-	UGB
Level control (C)	0x02	Step	-	UGB
Level control (C)	0x03	Stop	-	UGB
Level control (C)	0x04	Move to level (with on/off)	-	UGB
Level control (C)	0x05	Move (with on/off)	-	UGB
Level control (C)	0x06	Step (with on/off)	-	UGB
Level control (C)	0x07	Stop (with on/off)	-	UGB
Color control (C)	0x00	Move to hue	-	UGB
Color control (C)	0x01	Move hue	-	UGB
Color control (C)	0x02	Step hue	-	UGB
Color control (C)	0x03	Move to saturation	-	UGB
Color control (C)	0x04	Move saturation	-	UGB
Color control (C)	0x05	Step saturation	-	UGB
Color control (C)	0x06	Move to hue and saturation	-	UGB
Color control (C)	0x07	Move to color	-	UGB
Color control (C)	0x08	Move color	-	UGB
Color control (C)	0x09	Step color	-	UGB
Color control (C)	0x0a	Move to color temperature	-	UGB
Color control (C)	0x40	Enhanced move to hue	-	UGB
Color control (C)	0x41	Enhanced move hue	-	UGB
Color control (C)	0x42	Enhanced step hue	-	UGB
Color control (C)	0x43	Enhanced move to hue and saturation	-	UGB

Cluster	Identifier	Name	On receipt of	Permitted transmissions
Color control (C)	0x44	Color loop set	-	UGB
Color control (C)	0x47	Stop move step	-	UGB
Color control (C)	0x4b	Move color temperature	-	UGB
Color control (C)	0x4c	Step color temperature	-	UGB

1101

1102 ## 21.3 PICS

1103 The following PICS SHALL be supported for this device. Note that a device MAY support other
1104 optional PICS items.

Cluster	PICS
Basic [R6]	B.S B.S.A0000, B.S.A0001, B.S.A0002, B.S.A0003, B.S.A0004, B.S.A0005, B.S.A0006, B.S.A0007, B.S.A0008, B.S.A0009, B.S.A000a, B.S.A000b, B.S.A4000, B.S.Afffd
Identify [R7]	I.S, I.C I.S.A0000, I.S.Afffd, I.C.Afffd I.S.C00.Rsp, I.S.C01.Rsp, I.S.C40.Rsp, I.C.C00.Rsp I.S.C00.Tx, I.C.C01.Tx
On/off [R10]	OO.C OO.C.Afffd
Level Control [R11]	LC.C LC.C.Afffd
Color Control [R12]	CC.C CC.C.Afffd

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22 Color scene controller

The color scene controller is a controller device that, when bound to a lighting device such as a color light, can be used to switch the device on or off, adjust the intensity of the light being emitted and adjust the color of the light being emitted. In addition, the device can also be used for setting scenes.

22.1 Device configuration

When the color scene controller device type is implemented on an endpoint, the following configurations apply:

- The *application device version* field of the corresponding simple descriptor SHALL be set to 0x1.
- The device class SHALL be *simple*.
- The device SHALL implement a finding & binding *initiator*.

22.2 Supported clusters

The color scene controller device SHALL support the mandatory clusters and MAY support the recommended optional clusters listed in Figure 17.

	Color scene controller [Device ID: 0x0810]	
	Server clusters	**Client clusters**
Mandatory	0x0000: Basic	Identify: 0x0003
	0x0003: Identify	Scenes: 0x0005
		On/off: 0x0006
		Level control: 0x0008
		Color control: 0x0300
Recommended optional	*0x1000: Touchlink commissioning*	*Groups: 0x0004*
		OTA upgrade: 0x0019
		Touchlink commissioning:0x1000

Figure 17 – Clusters supported by the color scene controller device type

Note: If the touchlink commissioning cluster is supported on this device then the server side of the utility part of this cluster SHALL be mandatory (see also [R1]).

22.2.1 Required attributes

A color scene controller device SHALL support the attributes listed in Table 50.

Table 50 – Mandatory attributes for a color scene controller

Cluster	Identifier	Name	Scene table	Reportable
Basic (S)	0x0000	ZCLVersion	✖	-
Basic (S)	0x0001	ApplicationVersion	✖	-
Basic (S)	0x0002	StackVersion	✖	-

Cluster	Identifier	Name	Scene table	Reportable
Basic (S)	0x0003	HWVersion	×	-
Basic (S)	0x0004	ManufacturerName	×	-
Basic (S)	0x0005	ModelIdentifier	×	-
Basic (S)	0x0006	DateCode	×	-
Basic (S)	0x0007	PowerSource	×	-
Basic (S)	0x0008	GenericDeviceClass	×	-
Basic (S)	0x0009	GenericDeviceType	×	-
Basic (S)	0x000a	ProductCode	×	-
Basic (S)	0x000b	ProductURL	×	-
Basic (S)	0x4000	SWBuildID	×	-
Identify (S)	0x0000	IdentifyTime	×	-
All supported clusters (S&C)	0xfffd	ClusterRevision	×	-

22.2.2 Required commands received

A color scene controller device SHALL be able to receive and process the commands listed in Table 51.

Table 51 – Mandatory commands received by a color scene controller

Cluster	Identifier	Name	Mandatory on transmission of
Identify (S)	0x00	Identify	-
Identify (S)	0x01	Identify query	-
Identify (S)	0x40	Trigger effect	-
Identify (C)	0x00	Identify query response	Identify query
Scenes (C)	0x00	Add scene response	Add scene
Scenes (C)	0x01	View scene response	View scene
Scenes (C)	0x02	Remove scene response	Remove scene
Scenes (C)	0x03	Remove all scenes response	Remove all scenes
Scenes (C)	0x04	Store scene response	Store scene
Scenes (C)	0x06	Get scene membership response	Get scene membership
Scenes (C)	0x40	Enhanced add scene response	Enhanced add scene
Scenes (C)	0x41	Enhanced view scene response	Enhanced view scene
Scenes (C)	0x42	Copy scene response	Copy scene

22.2.3 Required commands generated

A color scene controller device SHALL generate the commands indicated with an asterisk (*) and MAY generate any of the other commands listed in Table 52.

Table 52 – Commands generated by a color scene controller

Cluster	Identifier	Name	On receipt of	Permitted transmissions
Identify (S)	0x00	Identify query response*	Identify query	U--
Identify (C)	0x00	Identify	-	UGB
Identify (C)	0x01	Identify query*	-	UGB
Identify (C)	0x40	Trigger effect	-	UGB
Scenes (C)	0x00	Add scene	-	U--
Scenes (C)	0x01	View scene	-	U--
Scenes (C)	0x02	Remove scene	-	UG-
Scenes (C)	0x03	Remove all scenes	-	UG-
Scenes (C)	0x04	Store scene	-	UG-
Scenes (C)	0x05	Recall scene	-	UG-
Scenes (C)	0x06	Get scene membership	-	UG-
Scenes (C)	0x40	Enhanced add scene	-	UGB
Scenes (C)	0x41	Enhanced view scene	-	UGB
Scenes (C)	0x42	Copy scene	-	UGB
On/off (C)	0x00	Off	-	UGB
On/off (C)	0x01	On	-	UGB
On/off (C)	0x02	Toggle	-	UGB
On/off (C)	0x40	Off with effect	-	UGB
On/off (C)	0x41	On with recall global scene	-	UGB
On/off (C)	0x42	On with timed off	-	UGB
Level control (C)	0x00	Move to level	-	UGB
Level control (C)	0x01	Move	-	UGB
Level control (C)	0x02	Step	-	UGB
Level control (C)	0x03	Stop	-	UGB
Level control (C)	0x04	Move to level (with on/off)	-	UGB
Level control (C)	0x05	Move (with on/off)	-	UGB
Level control (C)	0x06	Step (with on/off)	-	UGB
Level control (C)	0x07	Stop (with on/off)	-	UGB
Color control (C)	0x00	Move to hue	-	UGB
Color control (C)	0x01	Move hue	-	UGB
Color control (C)	0x02	Step hue	-	UGB

Cluster	Identifier	Name	On receipt of	Permitted transmissions
Color control (C)	0x03	Move to saturation	-	UGB
Color control (C)	0x04	Move saturation	-	UGB
Color control (C)	0x05	Step saturation	-	UGB
Color control (C)	0x06	Move to hue and saturation	-	UGB
Color control (C)	0x07	Move to color	-	UGB
Color control (C)	0x08	Move color	-	UGB
Color control (C)	0x09	Step color	-	UGB
Color control (C)	0x0a	Move to color temperature	-	UGB
Color control (C)	0x40	Enhanced move to hue	-	UGB
Color control (C)	0x41	Enhanced move hue	-	UGB
Color control (C)	0x42	Enhanced step hue	-	UGB
Color control (C)	0x43	Enhanced move to hue and saturation	-	UGB
Color control (C)	0x44	Color loop set	-	UGB
Color control (C)	0x47	Stop move step	-	UGB
Color control (C)	0x4b	Move color temperature	-	UGB
Color control (C)	0x4c	Step color temperature	-	UGB

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22.3 PICS

The following PICS SHALL be supported for this device. Note that a device MAY support other optional PICS items.

Cluster	PICS
Basic [R6]	B.S B.S.A0000, B.S.A0001, B.S.A0002, B.S.A0003, B.S.A0004, B.S.A0005, B.S.A0006, B.S.A0007, B.S.A0008, B.S.A0009, B.S.A000a, B.S.A000b, B.S.A4000, B.S.Afffd
Identify [R7]	I.S, I.C I.S.A0000, I.S.Afffd, I.C.Afffd I.S.C00.Rsp, I.S.C01.Rsp, I.S.C40.Rsp, I.C.C00.Rsp I.S.C00.Tx, I.C.C01.Tx
Scenes [R9]	S.C S.C.Afffd S.C.C00.Rsp, S.C.C01.Rsp, S.C.C02.Rsp, S.C.C03.Rsp, S.C.C04.Rsp, S.C.C06.Rsp, S.C.C40.Rsp, S.C.C41.Rsp, S.C.C42.Rsp
On/off [R10]	OO.C OO.C.Afffd
Level Control [R11]	LC.C LC.C.Afffd
Color Control [R12]	CC.C CC.C.Afffd

23 Non-color controller

The non-color controller is a controller device that, when bound to a lighting device such as a dimmable light, can be used to switch the device on or off and adjust the intensity of the light being emitted.

23.1 Device configuration

When the non-color controller device type is implemented on an endpoint, the following configurations apply:

- The *application device version* field of the corresponding simple descriptor SHALL be set to 0x1.
- The device class SHALL be *simple*.
- The device SHALL implement a finding & binding *initiator*.

23.2 Supported clusters

The non-color controller device SHALL support the mandatory clusters and MAY support the recommended optional clusters listed in Figure 18.

	Non-color controller [Device ID: 0x0820]	
	Server clusters	**Client clusters**
Mandatory	0x0000: Basic	Identify: 0x0003
	0x0003: Identify	On/off: 0x0006
		Level control: 0x0008
Recommended optional	*0x1000: Touchlink commissioning*	*Groups: 0x0004*
		OTA upgrade: 0x0019
		Touchlink commissioning: 0x1000

Figure 18 – Clusters supported by the non-color controller device type

Note: If the touchlink commissioning cluster is supported on this device then the server side of the utility part of this cluster SHALL be mandatory (see also [R1]).

23.2.1 Required attributes

A non-color controller device SHALL support the attributes listed in Table 53.

Table 53 – Mandatory attributes for a non-color controller

Cluster	Identifier	Name	Scene table	Reportable
Basic (S)	0x0000	ZCLVersion	×	-
Basic (S)	0x0001	ApplicationVersion	×	-
Basic (S)	0x0002	StackVersion	×	-
Basic (S)	0x0003	HWVersion	×	-
Basic (S)	0x0004	ManufacturerName	×	-

Cluster	Identifier	Name	Scene table	Reportable
Basic (S)	0x0005	ModelIdentifier	×	-
Basic (S)	0x0006	DateCode	×	-
Basic (S)	0x0007	PowerSource	×	-
Basic (S)	0x0008	GenericDeviceClass	×	-
Basic (S)	0x0009	GenericDeviceType	×	-
Basic (S)	0x000a	ProductCode	×	-
Basic (S)	0x000b	ProductURL	×	-
Basic (S)	0x4000	SWBuildID	×	-
Identify (S)	0x0000	IdentifyTime	×	-
All supported clusters (S&C)	0xfffd	ClusterRevision	×	-

23.2.2 Required commands received

A non-color controller device SHALL be able to receive and process the commands listed in Table 54.

Table 54 – Mandatory commands received by a non-color controller

Cluster	Identifier	Name	Mandatory on transmission of
Identify (S)	0x00	Identify	-
Identify (S)	0x01	Identify query	-
Identify (S)	0x40	Trigger effect	-
Identify (C)	0x00	Identify query response	Identify query

23.2.3 Required commands generated

A non-color controller device SHALL generate the commands indicated with an asterisk (*) and MAY generate any of the other commands listed in Table 55.

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1182 **Table 55 – Commands generated by a non-color controller**

Cluster	Identifier	Name	On receipt of	Permitted transmissions
Identify (S)	0x00	Identify query response*	Identify query	U--
Identify (C)	0x00	Identify	-	UGB
Identify (C)	0x01	Identify query*	-	UGB
Identify (C)	0x40	Trigger effect	-	UGB
On/off (C)	0x00	Off	-	UGB
On/off (C)	0x01	On	-	UGB
On/off (C)	0x02	Toggle	-	UGB
On/off (C)	0x40	Off with effect	-	UGB
On/off (C)	0x41	On with recall global scene	-	UGB
On/off (C)	0x42	On with timed off	-	UGB
Level control (C)	0x00	Move to level	-	UGB
Level control (C)	0x01	Move	-	UGB
Level control (C)	0x02	Step	-	UGB
Level control (C)	0x03	Stop	-	UGB
Level control (C)	0x04	Move to level (with on/off)	-	UGB
Level control (C)	0x05	Move (with on/off)	-	UGB
Level control (C)	0x06	Step (with on/off)	-	UGB
Level control (C)	0x07	Stop (with on/off)	-	UGB

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23.3 PICS

The following PICS SHALL be supported for this device. Note that a device MAY support other optional PICS items.

Cluster	PICS
Basic [R6]	B.S B.S.A0000, B.S.A0001, B.S.A0002, B.S.A0003, B.S.A0004, B.S.A0005, B.S.A0006, B.S.A0007, B.S.A0008, B.S.A0009, B.S.A000a, B.S.A000b, B.S.A4000, B.S.Afffd
Identify [R7]	I.S, I.C I.S.A0000, I.S.Afffd, I.C.Afffd I.S.C00.Rsp, I.S.C01.Rsp, I.S.C40.Rsp, I.C.C00.Rsp I.S.C00.Tx, I.C.C01.Tx
On/off [R10]	OO.C OO.C.Afffd
Level Control [R11]	LC.C LC.C.Afffd

24 Non-color scene controller

The non-color scene controller is a controller device that, when bound to a lighting device such as a dimmable light, can be used to switch the device on or off and adjust the intensity of the light being emitted. In addition, the device can also be used for setting scenes.

24.1 Device configuration

When non-color scene controller device type is implemented on an endpoint, the following configurations apply:

- The *application device version* field of the corresponding simple descriptor SHALL be set to 0x1.
- The device class SHALL be *simple*.
- The device SHALL implement a finding & binding *initiator*.

24.2 Supported clusters

The non-color scene controller device SHALL support the mandatory clusters and MAY support the recommended optional clusters listed in Figure 19.

	Non-color scene controller [Device ID: 0x0830]	
	Server clusters	**Client clusters**
Mandatory	0x0000: Basic	Identify: 0x0003
	0x0003: Identify	Scenes: 0x0005
		On/off: 0x0006
		Level control: 0x0008
Recommended optional	*0x1000: Touchlink commissioning*	*Groups: 0x0004*
		OTA upgrade: 0x0019
		Touchlink commissioning: 0x1000

Figure 19 – Clusters supported by the non-color scene controller device type

Note: If the touchlink commissioning cluster is supported on this device then the server side of the utility part of this cluster SHALL be mandatory (see also [R1]).

24.2.1 Required attributes

A non-color scene controller device SHALL support the attributes listed in Table 56.

Table 56 – Mandatory attributes for a non-color scene controller

Cluster	Identifier	Name	Scene table	Reportable
Basic (S)	0x0000	ZCLVersion	×	-
Basic (S)	0x0001	ApplicationVersion	×	-
Basic (S)	0x0002	StackVersion	×	-
Basic (S)	0x0003	HWVersion	×	-

Cluster	Identifier	Name	Scene table	Reportable
Basic (S)	0x0004	ManufacturerName	×	-
Basic (S)	0x0005	ModelIdentifier	×	-
Basic (S)	0x0006	DateCode	×	-
Basic (S)	0x0007	PowerSource	×	-
Basic (S)	0x0008	GenericDeviceClass	×	-
Basic (S)	0x0009	GenericDeviceType	×	-
Basic (S)	0x000a	ProductCode	×	-
Basic (S)	0x000b	ProductURL	×	-
Basic (S)	0x4000	SWBuildID	×	-
Identify (S)	0x0000	IdentifyTime	×	-
All supported clusters (S&C)	0xfffd	ClusterRevision	×	-

24.2.2 Required commands received

A non-color scene controller device SHALL be able to receive and process the commands listed in Table 57.

Table 57 – Mandatory commands received by a non-color scene controller

Cluster	Identifier	Name	Mandatory on transmission of
Identify (S)	0x00	Identify	-
Identify (S)	0x01	Identify query	-
Identify (S)	0x40	Trigger effect	-
Identify (C)	0x00	Identify query response	Identify query
Scenes (C)	0x00	Add scene response	Add scene
Scenes (C)	0x01	View scene response	View scene
Scenes (C)	0x02	Remove scene response	Remove scene
Scenes (C)	0x03	Remove all scenes response	Remove all scenes
Scenes (C)	0x04	Store scene response	Store scene
Scenes (C)	0x06	Get scene membership response	Get scene membership
Scenes (C)	0x40	Enhanced add scene response	Enhanced add scene
Scenes (C)	0x41	Enhanced view scene response	Enhanced view scene
Scenes (C)	0x42	Copy scene response	Copy scene

24.2.3 Required commands generated

A non-color scene controller device SHALL generate the commands indicated with an asterisk (*) and MAY generate any of the other commands listed in Table 58.

Table 58 – Commands generated by a non-color scene controller

Cluster	Identifier	Name	On receipt of	Permitted transmissions
Identify (S)	0x00	Identify query response*	Identify query	U--
Identify (C)	0x00	Identify	-	UGB
Identify (C)	0x01	Identify query*	-	UGB
Identify (C)	0x40	Trigger effect	-	UGB
Scenes (C)	0x00	Add scene	-	U--
Scenes (C)	0x01	View scene	-	U--
Scenes (C)	0x02	Remove scene	-	UG-
Scenes (C)	0x03	Remove all scenes	-	UG-
Scenes (C)	0x04	Store scene	-	UG-
Scenes (C)	0x05	Recall scene	-	UG-
Scenes (C)	0x06	Get scene membership	-	UG-
Scenes (C)	0x40	Enhanced add scene	-	UGB
Scenes (C)	0x41	Enhanced view scene	-	UGB
Scenes (C)	0x42	Copy scene	-	UGB
On/off (C)	0x00	Off	-	UGB
On/off (C)	0x01	On	-	UGB
On/off (C)	0x02	Toggle	-	UGB
On/off (C)	0x40	Off with effect	-	UGB
On/off (C)	0x41	On with recall global scene	-	UGB
On/off (C)	0x42	On with timed off	-	UGB
Level control (C)	0x00	Move to level	-	UGB
Level control (C)	0x01	Move	-	UGB
Level control (C)	0x02	Step	-	UGB
Level control (C)	0x03	Stop	-	UGB
Level control (C)	0x04	Move to level (with on/off)	-	UGB
Level control (C)	0x05	Move (with on/off)	-	UGB
Level control (C)	0x06	Step (with on/off)	-	UGB
Level control (C)	0x07	Stop (with on/off)	-	UGB

24.3 PICS

The following PICS SHALL be supported for this device. Note that a device MAY support other optional PICS items.

Cluster	PICS
Basic [R6]	B.S B.S.A0000, B.S.A0001, B.S.A0002, B.S.A0003, B.S.A0004, B.S.A0005, B.S.A0006, B.S.A0007, B.S.A0008, B.S.A0009, B.S.A000a, B.S.A000b, B.S.A4000, B.S.Afffd
Identify [R7]	I.S, I.C I.S.A0000, I.S.Afffd, I.C.Afffd I.S.C00.Rsp, I.S.C01.Rsp, I.S.C40.Rsp, I.C.C00.Rsp I.S.C00.Tx, I.C.C01.Tx
Scenes [R9]	S.C S.C.Afffd S.C.C00.Rsp, S.C.C01.Rsp, S.C.C02.Rsp, S.C.C03.Rsp, S.C.C04.Rsp, S.C.C06.Rsp, S.C.C40.Rsp, S.C.C41.Rsp, S.C.C42.Rsp
On/off [R10]	OO.C OO.C.Afffd
Level Control [R11]	LC.C LC.C.Afffd

25 Control bridge

The control bridge is a controller device that, when bound to a lighting device such as a color light, can be used to switch the device on or off, adjust the intensity of the light being emitted and adjust the color of the light being emitted. In addition, the device can also be used for setting scenes.

25.1 Device configuration

When the control bridge device type is implemented on an endpoint, the following configurations apply:

- The *application device version* field of the corresponding simple descriptor SHALL be set to 0x1.
- The device class SHALL be *dynamic*.

25.2 Supported clusters

The control bridge device SHALL support the mandatory clusters and MAY support the recommended optional clusters listed in Figure 20.

	Control bridge [Device ID: 0x0840]	
	Server clusters	**Client clusters**
Mandatory	0x0000: Basic	Identify: 0x0003
	0x0003: Identify	Groups: 0x0004
		Scenes: 0x0005
		On/off: 0x0006
		Level control: 0x0008
		Color control: 0x0300
Recommended optional	*0x0019: OTA Upgrade*	*OTA upgrade: 0x0019*
	0x1000: Touchlink commissioning	*Illuminance measurement: 0x0400*
		Illuminance level sensing: 0x0401
		Occupancy sensing: 0x0406
		Touchlink commissioning: 0x1000

Figure 20 – Clusters supported by the control bridge device type

Note: If the touchlink commissioning cluster is supported on this device then the server side of the utility part of this cluster SHALL be mandatory (see also [R1]).

25.2.1 Required attributes

A control bridge device SHALL support the attributes listed in Table 59.

Table 59 – Mandatory attributes for a control bridge

Cluster	Identifier	Name	Scene table	Reportable
Basic (S)	0x0000	ZCLVersion	✘	-
Basic (S)	0x0001	ApplicationVersion	✘	-

Cluster	Identifier	Name	Scene table	Reportable
Basic (S)	0x0002	StackVersion	×	-
Basic (S)	0x0003	HWVersion	×	-
Basic (S)	0x0004	ManufacturerName	×	-
Basic (S)	0x0005	ModelIdentifier	×	-
Basic (S)	0x0006	DateCode	×	-
Basic (S)	0x0007	PowerSource	×	-
Basic (S)	0x0008	GenericDeviceClass	×	-
Basic (S)	0x0009	GenericDeviceType	×	-
Basic (S)	0x000a	ProductCode	×	-
Basic (S)	0x000b	ProductURL	×	-
Basic (S)	0x4000	SWBuildID	×	-
Identify (S)	0x0000	IdentifyTime	×	-
All supported clusters (S&C)	0xfffd	ClusterRevision	×	-

1254

1255 ### 25.2.2 Required commands received

1256 A control bridge device SHALL be able to receive and process the commands listed in Table 60.
1257

1258 **Table 60 – Mandatory commands received by a control bridge**

Cluster	Identifier	Name	Mandatory on transmission of
Identify (S)	0x00	Identify	-
Identify (S)	0x01	Identify query	-
Identify (S)	0x40	Trigger effect	-
Identify (C)	0x00	Identify query response	Identify query
Groups (C)	0x00	Add group response	Add group
Groups (C)	0x01	View group response	View group
Groups (C)	0x02	Get group membership response	Get group membership
Groups (C)	0x03	Remove group response	Remove group
Scenes (C)	0x00	Add scene response	Add scene
Scenes (C)	0x01	View scene response	View scene
Scenes (C)	0x02	Remove scene response	Remove scene
Scenes (C)	0x03	Remove all scenes response	Remove all scenes
Scenes (C)	0x04	Store scene response	Store scene

Cluster	Identifier	Name	Mandatory on transmission of
Scenes (C)	0x06	Get scene membership response	Get scene membership
Scenes (C)	0x40	Enhanced add scene response	Enhanced add scene
Scenes (C)	0x41	Enhanced view scene response	Enhanced view scene
Scenes (C)	0x42	Copy scene response	Copy scene

1259

1260 ### 25.2.3 Required commands generated

1261 A control bridge device SHALL generate the commands indicated with an asterisk (*) and MAY
1262 generate any of the other commands listed in Table 61.

1263

1264 **Table 61 – Commands generated by a control bridge**

Cluster	Identifier	Name	On receipt of	Permitted transmissions
Identify (S)	0x00	Identify query response*	Identify query	U--
Identify (C)	0x00	Identify	-	UGB
Identify (C)	0x01	Identify query	-	UGB
Identify (C)	0x40	Trigger effect	-	UGB
Groups (C)	0x00	Add group	-	UGB
Groups (C)	0x01	View group	-	UGB
Groups (C)	0x02	Get group membership	-	UGB
Groups (C)	0x03	Remove group	-	UGB
Groups (C)	0x04	Remove all groups	-	UGB
Groups (C)	0x05	Add group if identifying	-	UGB
Scenes (C)	0x00	Add scene	-	U--
Scenes (C)	0x01	View scene	-	U--
Scenes (C)	0x02	Remove scene	-	UG-
Scenes (C)	0x03	Remove all scenes	-	UG-
Scenes (C)	0x04	Store scene	-	UG-
Scenes (C)	0x05	Recall scene	-	UG-
Scenes (C)	0x06	Get scene membership	-	UG-
Scenes (C)	0x40	Enhanced add scene	-	UGB
Scenes (C)	0x41	Enhanced view scene	-	UGB
Scenes (C)	0x42	Copy scene	-	UGB

Cluster	Identifier	Name	On receipt of	Permitted transmissions
On/off (C)	0x00	Off	-	UGB
On/off (C)	0x01	On	-	UGB
On/off (C)	0x02	Toggle	-	UGB
On/off (C)	0x40	Off with effect	-	UGB
On/off (C)	0x41	On with recall global scene	-	UGB
On/off (C)	0x42	On with timed off	-	UGB
Level control (C)	0x00	Move to level	-	UGB
Level control (C)	0x01	Move	-	UGB
Level control (C)	0x02	Step	-	UGB
Level control (C)	0x03	Stop	-	UGB
Level control (C)	0x04	Move to level (with on/off)	-	UGB
Level control (C)	0x05	Move (with on/off)	-	UGB
Level control (C)	0x06	Step (with on/off)	-	UGB
Level control (C)	0x07	Stop (with on/off)	-	UGB
Color control (C)	0x00	Move to hue	-	UGB
Color control (C)	0x01	Move hue	-	UGB
Color control (C)	0x02	Step hue	-	UGB
Color control (C)	0x03	Move to saturation	-	UGB
Color control (C)	0x04	Move saturation	-	UGB
Color control (C)	0x05	Step saturation	-	UGB
Color control (C)	0x06	Move to hue and saturation	-	UGB
Color control (C)	0x07	Move to color	-	UGB
Color control (C)	0x08	Move color	-	UGB
Color control (C)	0x09	Step color	-	UGB
Color control (C)	0x0a	Move to color temperature	-	UGB
Color control (C)	0x40	Enhanced move to hue	-	UGB
Color control (C)	0x41	Enhanced move hue	-	UGB
Color control (C)	0x42	Enhanced step hue	-	UGB
Color control (C)	0x43	Enhanced move to hue and saturation	-	UGB
Color control (C)	0x44	Color loop set	-	UGB
Color control (C)	0x47	Stop move step	-	UGB
Color control (C)	0x4b	Move color temperature	-	UGB
Color control (C)	0x4c	Step color temperature	-	UGB

1265

1266

25.3 PICS

The following PICS SHALL be supported for this device. Note that a device MAY support other optional PICS items.

Cluster	PICS
Basic [R6]	B.S B.S.A0000, B.S.A0001, B.S.A0002, B.S.A0003, B.S.A0004, B.S.A0005, B.S.A0006, B.S.A0007, B.S.A0008, B.S.A0009, B.S.A000a, B.S.A000b, B.S.A4000, B.S.Afffd
Identify [R7]	I.S, I.C I.S.A0000, I.S.Afffd, I.C.Afffd I.S.C00.Rsp, I.S.C01.Rsp, I.S.C40.Rsp, I.C.C00.Rsp I.S.C00.Tx
Groups [R8]	G.C G.C.Afffd G.C.C00.Rsp, G.C.C01.Rsp, G.C.C02.Rsp, G.C.C03.Rsp
Scenes [R9]	S.C S.C.Afffd S.C.C00.Rsp, S.C.C01.Rsp, S.C.C02.Rsp, S.C.C03.Rsp, S.C.C04.Rsp, S.C.C06.Rsp, S.C.C40.Rsp, S.C.C41.Rsp, S.C.C42.Rsp
On/off [R10]	OO.C OO.C.Afffd
Level Control [R11]	LC.C LC.C.Afffd
Color Control [R12]	CC.C CC.C.Afffd

26 On/off sensor

The on/off sensor is a measurement and sensing device that, when bound to a lighting device such as a color light, can be used to switch the device on or off.

26.1 Device configuration

When the on/off sensor device type is implemented on an endpoint, the following configurations apply:

- The *application device version* field of the corresponding simple descriptor SHALL be set to 0x1.
- The device class SHALL be *simple*.
- The device SHALL implement a finding & binding *initiator*.

26.2 Supported clusters

The on/off sensor device SHALL support the mandatory clusters and MAY support the recommended optional clusters listed in Figure 21.

	On/off sensor [Device ID: 0x0850]	
	Server clusters	**Client clusters**
Mandatory	0x0000: Basic	Identify: 0x0003
	0x0003: Identify	On/off: 0x0006
Recommended optional	*0x1000: Touchlink commissioning*	*Groups: 0x0004*
		Scenes: 0x0005
		Level control: 0x0008
		OTA upgrade: 0x0019
		Color control: 0x0300
		Touchlink commissioning: 0x1000

Figure 21 – Clusters supported by the on/off sensor device type

26.2.1 Required attributes

An on/off sensor device SHALL support the attributes listed in Table 62.

Table 62 – Mandatory attributes for an on/off sensor

Cluster	Identifier	Name	Scene table	Reportable
Basic (S)	0x0000	ZCLVersion	×	-
Basic (S)	0x0001	ApplicationVersion	×	-
Basic (S)	0x0002	StackVersion	×	-
Basic (S)	0x0003	HWVersion	×	-
Basic (S)	0x0004	ManufacturerName	×	-
Basic (S)	0x0005	ModelIdentifier	×	-
Basic (S)	0x0006	DateCode	×	-

Cluster	Identifier	Name	Scene table	Reportable
Basic (S)	0x0007	PowerSource	×	-
Basic (S)	0x0008	GenericDeviceClass	×	-
Basic (S)	0x0009	GenericDeviceType	×	-
Basic (S)	0x000a	ProductCode	×	-
Basic (S)	0x000b	ProductURL	×	-
Basic (S)	0x4000	SWBuildID	×	-
Identify (S)	0x0000	IdentifyTime	×	-
All supported clusters (S&C)	0xfffd	ClusterRevision	×	-

1290

1291 ### 26.2.2 Required commands received

1292 An on/off sensor device SHALL be able to receive and process the commands listed in Table 63.

1293

1294 **Table 63 – Mandatory commands received by an on/off sensor**

Cluster	Identifier	Name	Mandatory on transmission of
Identify (S)	0x00	Identify	-
Identify (S)	0x01	Identify query	-
Identify (S)	0x40	Trigger effect	-
Identify (C)	0x00	Identify query response	Identify query

1295

1296 ### 26.2.3 Required commands generated

1297 An on/off sensor device SHALL generate the commands indicated with an asterisk (*) and MAY
1298 generate any of the other commands listed in Table 64.

1299

1300 **Table 64 – Commands generated by an on/off sensor**

Cluster	Identifier	Name	On receipt of	Permitted transmissions
Identify (S)	0x00	Identify query response*	Identify query	U--
Identify (C)	0x00	Identify	-	UGB
Identify (C)	0x01	Identify query*	-	UGB
Identify (C)	0x40	Trigger effect	-	UGB
On/off (C)	0x00	Off	-	UGB
On/off (C)	0x01	On	-	UGB
On/off (C)	0x02	Toggle	-	UGB
On/off (C)	0x40	Off with effect	-	UGB

Cluster	Identifier	Name	On receipt of	Permitted transmissions
On/off (C)	0x41	On with recall global scene	-	UGB
On/off (C)	0x42	On with timed off	-	UGB

26.3 PICS

The following PICS SHALL be supported for this device. Note that a device MAY support other optional PICS items.

Cluster	PICS
Basic [R6]	B.S B.S.A0000, B.S.A0001, B.S.A0002, B.S.A0003, B.S.A0004, B.S.A0005, B.S.A0006, B.S.A0007, B.S.A0008, B.S.A0009, B.S.A000a, B.S.A000b, B.S.A4000, B.S.Afffd
Identify [R7]	I.S, I.C I.S.A0000, I.S.Afffd, I.C.Afffd I.S.C00.Rsp, I.S.C01.Rsp, I.S.C40.Rsp, I.C.C00.Rsp I.S.C00.Tx, I.C.C01.Tx
On/off [R10]	OO.C OO.C.Afffd

27 ZCL enhancements

This clause specifies the enhancements to specific cluster defined in the ZCL (see [R1]) required by this specification.

27.1 Clusters enhanced in this specification

The devices specified in this document require the enhancements to the clusters listed in Table 65. Each cluster will be discussed in the following sub-sections.

Table 65 – Cluster enhancements specified in this specification

Cluster ID	Cluster name	Reference
0x0000	Basic	27.2
0x0006	On/off	27.3
0x0008	Level control	27.4
0x0300	Color control	27.5

27.2 Basic cluster [0x0000]

27.2.1 Server

27.2.1.1 Attributes

When a device implements the *basic* cluster at the ZCL server side, it SHALL support the additional attributes listed in Table 66.

Table 66 – Additional attributes of the server side of the basic cluster

Identifier	Name	Type	Range	Access	Default	Mandatory/ Optional
0x0008	*GenericDevice-Class*	8-bit enumeration	0x00-0xff	Read only	0xff	Optional
0x0009	*GenericDevice-Type*	8-bit enumeration	0x00-0xff	Read only	0xff	Optional
0x000a	*ProductCode*	Octet string	-	Read only	-	Optional
0x000b	*ProductURL*	Character string	-	Read only	-	Optional

27.2.1.1.1 *GenericDeviceClass* attribute

The *GenericDeviceClass* attribute define the field of application of the *GenericDeviceType* attribute. It SHALL be set to one of the non-reserved values listed in Table 67.

1328 **Table 67 - Values of the *GenericDeviceClass* attribute**

***GenericDeviceClass* value**	**Description**
0x00	Lighting
0x01 – 0xff	Reserved

1329

1330 #### 27.2.1.1.2 *GenericDeviceType* attribute

1331 The *GenericDeviceType* attribute allows an application to show an icon on a rich user interface (e.g.
1332 smartphone app).

1333 Notes on the usage of the *GenericDeviceType* attribute:

1334 • lamps with integrated radio module SHALL have a proper value indicating the lamp type,
1335 according to the table below;
1336 • devices that cannot be assigned to a proper category SHALL be set as “unspecified”;

1337

1338 When the *GenericDeviceClass* attribute is set to 0x00 (i.e. lighting) the *GenericDeviceType* attribute
1339 SHALL be set to one of the non-reserved values listed in Table 68.

1340

1341 **Table 68 – Values of the *GenericDeviceType* attribute for the lighting class**

***GenericDeviceType* value**	**Description**
0x00	Incandescent
0x01	spotlight Halogen
0x02	Halogen bulb
0x03	CFL
0x04	Linear Fluorescent
0x05	LED bulb
0x06	Spotlight LED
0x07	LED strip
0x08	LED tube
0x09	Generic indoor luminaire/light fixture
0x0a	Generic outdoor luminaire/light fixture
0x0b	Pendant Luminaire/light fixture
0x0c	Floor standing luminaire/light fixture
0x0d – 0xdf	Reserved
0xe0	Generic Controller (e.g. Remote controller)
0xe1	Wall Switch
0xe2	Portable remote controller
0xe3	Motion sensor / light sensor
0xe4 – 0xef	Reserved

GenericDeviceType value	Description
0xf0	Generic actuator
0xf1	Wall socket
0xf2	Gateway/Bridge
0xf3	Plug-in unit
0xf4	Retrofit actuator
0xf5 … 0xfe	Reserved
0xff	Unspecified

27.2.1.1.3 *ProductCode* attribute

The *ProductCode* attribute allows an application to specify a code for the product. The *ProductCode* attribute SHALL have the format defined in Figure 22.

Octets:1	1	variable
Octet count	CodeId (see Table 69)	The code represented as an sequence of ASCII characters
	Octet data	

Figure 22 – Format of the *ProductCode* attribute

Table 69 – Values of the *CodeId* field of the *ProductCode* attribute

Code ID	Code type
0x00	Manufacturer defined
0x01	International article number (EAN)
0x02	Global trade item number (GTIN)
0x03	Universal product code (UPC)
0x04	Stock keeping unit (SKU)
0x05…0xff	Reserved

In case no code has been provided, the length field SHALL be set to 0 (i.e. the octet string is empty).

27.2.1.1.4 *ProductURL* attribute

The *ProductURL* attribute specifies a link to a web page containing specific product information.

Notes on the usage of the *ProductURL* attribute:

- The length of the URL SHALL be limited by the maximum number of bytes that can be transmitted from the application in a single frame. In most cases, such limit is around 50 bytes.
- In case no URL has been provided, the string SHALL be empty (i.e. the first byte is set to zero).

27.3 On/off cluster [0x0006]

27.3.1 Server

27.3.1.1 Attributes

When a device implements the *on/off* cluster at the ZCL server side, it SHALL support the additional attributes listed in Table 70.

Table 70 – Additional attributes of the server side of the *on/off* cluster

Identifier	Name	Type	Range	Access	Default	Mandatory/ Optional
0x4003	*StartUpOnOff*	8-bit enumeration	0x00-0xff	Read/Write	Defined by manufacturer	Optional

27.3.1.1.1 *StartUpOnOff* attribute

The *StartUpOnOff* attribute SHALL define the desired startup behavior of a lamp device when it is supplied with power and this state SHALL be reflected in the *OnOff* attribute. The values of the *StartUpOnOff* attribute are listed in Table 71.

Table 71 – Values of the *StartUpOnOff* attribute

***StartUpOnOff* value**	**Action on power up**
0x00	Set the *OnOff* attribute to 0 (off).
0x01	Set the *OnOff* attribute to 1 (on).
0x02	If the previous value of the *OnOff* attribute is equal to 0, set the *OnOff* attribute to 1. If the previous value of the *OnOff* attribute is equal to 1, set the *OnOff* attribute to 0 (toggle).
0x03 – 0xfe	These values are reserved. No action.
0xff	Set the *OnOff* attribute to its previous value.

27.4 Level control cluster [0x0008]

27.4.1 Server

27.4.1.1 Attributes

For devices implemented according to this specification, the *CurrentLevel* attribute SHALL be interpreted as follows:

- A value of 0x00 SHALL not be used.
- A value of 0x01 SHALL indicate the minimum level that can be attained on a device.
- A value of 0xfe SHALL indicate the maximum level that can be attained on a device.
- A value of 0xff SHALL represent an undefined value.
- All other values are application specific gradations from the minimum to the maximum level.

When a device implements the server side of the *Level control* cluster, it SHALL support the additional attributes listed in Table 72.

Table 72 – Additional attributes of the server side of the *level control* cluster

Identifier	Name	Type	Range	Access	Default	Mandatory/ Optional
0x000f	*Options*	8-bit bitmap	0b000000xx	Read/write	0b00000000	Mandatory
0x4000	*StartUp-CurrentLevel*	Unsigned 8-bit integer	0x00-0xff	Read/write	Defined by manufacturer	Optional

27.4.1.1.1 *Options* attribute

The *Options* attribute SHALL be enhanced as follows:

Bit	Name	Values & Summary
0	ExecuteIfOff	See [R1].
1	CoupleColorTempToLevel (See also 27.5.1.3)	0 – Do not couple changes to the *CurrentLevel* attribute with the color temperature.
		1 – Couple changes to the *CurrentLevel* attribute with the color temperature.

27.4.1.1.2 *StartUpCurrentLevel* attribute

The *StartUpCurrentLevel* attribute SHALL define the desired startup level a lamp SHALL use when it is supplied with power and this level SHALL be reflected in the *CurrentLevel* attribute. The values of the *StartUpCurrentLevel* attribute are listed in Table 73.

1400 **Table 73 – Values of the *StartUpCurrentLevel* attribute**

***StartUpCurrentLevel* value**	**Action on power up**
0x00	Set the *CurrentLevel* attribute to the minimum value permitted on the device (see also 27.4.1.1).
0x01 – 0xfe	Set the *CurrentLevel* attribute to this value.
0xff	Set the *CurrentLevel* attribute to its previous value.

1401

1402 ## 27.5 Color Control Cluster [0x0300]

1403 ### 27.5.1 Server

1404 #### 27.5.1.1 Attributes

1405 When a device implements the server side of the *color control* cluster, it SHALL support the additional
1406 attributes listed in Table 74 if the *ColorTemperatureMireds* attribute is supported (*).

1407

1408 **Table 74 – Additional attributes of the server side of the color control cluster**

Identifier	**Name**	**Type**	**Range**	**Access**	**Default**	**Mandatory/ Optional**
0x400d	*CoupleColorTemp-ToLevelMin-Mireds*	Unsigned 16-bit integer	*ColorTemp-PhysicalMinMireds* to *ColorTemp-PhysicalMaxMireds*	Read only	Defined by manufacturer	Mandatory*
0x4010	*StartUp-ColorTemperature-Mireds*	Unsigned 16-bit integer	0x0000-0xffff	Read/Write	Defined by manufacturer	Mandatory*

1409

1410 ##### 27.5.1.1.1 *CoupleColorTempToLevelMinMireds* attribute

1411 The *CoupleColorTempToLevelMinMireds* attribute specifies a lower bound on the value of the
1412 *ColorTemperatureMireds* attribute for the purposes of coupling the *ColorTemperatureMireds* attribute
1413 to the *CurrentLevel* attribute when the *CoupleColorTempToLevel* bit of the *Options* attribute of the
1414 *Level Control* cluster is equal to 1. When coupling the *ColorTemperatureMireds* attribute to the
1415 *CurrentLevel* attribute, this value SHALL correspond to a *CurrentLevel* value of 0xfe (100%).

1416 This attribute SHALL be set such that the following relationship exists:

1417 $$ColorTempPhysicalMinMireds \leq CoupleColorTempToLevelMinMireds \leq ColorTemperatureMireds$$

1418 Note that since this attribute is stored as a micro reciprocal degree (mired) value (i.e. color temperature
1419 in kelvins = 1,000,000 / *CoupleColorTempToLevelMinMireds*), the *CoupleColorTempToLevel-*
1420 *MinMireds* attribute corresponds to an upper bound on the value of the color temperature in kelvins
1421 supported by the device.

27.5.1.1.2 *StartUpColorTemperatureMireds* attribute

The *StartUpColorTemperatureMireds* attribute SHALL define the desired startup color temperature value a lamp SHALL use when it is supplied with power and this value SHALL be reflected in the *ColorTemperatureMireds* attribute. In addition, the *ColorMode* and *EnhancedColorMode* attributes SHALL be set to 0x02 (*color temperature*). The values of the *StartUpColorTemperatureMireds* attribute are listed in Table 75.

Table 75 – Values of the *StartUpColorTemperatureMireds* attribute

***StartUpColorTemperatureMireds* value**	**Action on power up**
0x0000 – 0xffef	Set the *ColorTemperatureMireds* attribute to this value.
0xffff	Set the *ColorTemperatureMireds* attribute to its previous value.

27.5.1.2 Scene table enhancements

The following attribute SHALL be added to the scene table when the *scenes* cluster server is implemented:

ColorTemperatureMireds

Note that this attribute SHALL be added as attribute 8 of the scene table extensions listed in [R1].

27.5.1.3 Coupling color temperature to level

If the *Level Control* cluster is supported on the same endpoint as the *Color Control* cluster and color temperature is supported, it is possible to couple changes in the current level to the color temperature.

The *CoupleColorTempToLevel* bit of the *Options* attribute of the *Level Control* cluster indicates whether the color temperature is to be linked with the *CurrentLevel* attribute in the *Level Control* cluster.

If the *CoupleColorTempToLevel* bit of the *Options* attribute of the *Level Control* cluster is equal to 1 and the *ColorMode* or *EnhancedColorMode* attribute is set to 0x02 (*color temperature*) then a change in the *CurrentLevel* attribute SHALL affect the *ColorTemperatureMireds* attribute. This relationship is manufacturer specific, with the qualification that the maximum value of the *CurrentLevel* attribute SHALL correspond to a *ColorTemperatureMired* attribute value equal to the *CoupleColorTempToLevelMinMireds* attribute. This relationship is one-way so a change to the *ColorTemperatureMireds* attribute SHALL NOT have any effect on the *CurrentLevel* attribute.

In order to simulate the behavior of an incandescent bulb, a low value of the *CurrentLevel* attribute SHALL be associated with a high value of the *ColorTemperatureMireds* attribute (i.e., a low value of color temperature in kelvins).

If the *CoupleColorTempToLevel* bit of the *Options* attribute of the *Level Control* cluster is equal to 0, there SHALL be no link between color temperature and current level.