Application Descriptions

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1

Lighting

Lighting Sensors

Supplement 1
LTE-Mode Extensions

Summary

This document specifies the Functional Blocks for sensors in the Lighting Application Domain.

Version 01.00.02 is a KNX Approved Standard.

This document is part of the KNX Specifications v2.1.

Document updates

Version	Date	Modifications
AN141 v02	2011.10.27	Preparation of the Draft for Voting.
7/20/1 S1 v01.00.00	2013.10.22	Publication as Chapter 7/20/1 Supplement 1 “Lighting Sensors – LTE-Mode Extensions”
01.00.02	2013.10.29	Editorial updates for the publication of KNX Specifications 2.1.

References

[01] Chapter 7/20/1 “Lighting Sensors”

Filename: 07_20_01 Supp 1 Lighting sensors - LTE-Mode extensions AS v01.00.02.docx
Version: 01.00.02
Status: Approved Standard
Savedate: 2013.10.29
Number of pages: 53

Contents

Abbreviations

COV	Change Of Value
IBS	FB Indoor Brightness Sensor
ILS	FB Indoor Luminance Sensor
IR	LTE-Mode InfoReport service
LDSB	FB Light Dimming Sensor Basic
LDAB	FB Light Dimming Actuator Basic
LSAB	FB Light Switching Actuator Basic
LSSB	FB Light Switching Sensor Basic
LTE-Mode	Logical Tag Extended easy mode

1 FB Light Switching Sensor Basic (LSSB)

1.1 Aims and objectives

The definitions in this document for FB Light Switching Sensor Basic (LSSB) are an add-on to the existing FB Specification in [01] to describe the LTE-Mode runtime interface and LTE-Mode specific parameters of FB LSSB.

The FB LSSB is used in the Application Domain Lighting to notify light switching commands to:

- switching and dimming actuators (traditional direct sensor – actuator communication)
- or to provide light switching sensor data to a Lighting Controller (sensor – controller – actuator communication)

The Inputs and Outputs of FB LSSB are specified in this document but not the Human Machine Interface (HMI). Consequently, the manufacturers of the button or switch have the possibility to implement their design and their operation methods.

1.2 Functional specification

1.2.1 Overview

The FB Light Switching Sensor Basic

- provides hardwired inputs or local push-button/HMI functionality to trigger output messages to control the On/Off status
  - of FB Light Switching Actuator Basic (LSAB)
  - or FB Light Dimming Actuator Basic (LDAB)
- receives status feedback messages from light switching/dimming actuators according to the FB specification in [01]

Binding of LSSB and LSAB / LDAB FBs is based on LTE-Mode zoning concepts. Control and status feedback information are exchanged according to LTE-Mode mechanisms in a common LightingGroup.

In the LTE-Mode runtime system LightingGroup is mapped to existing LTE-Mode Geographical zones.

Runtime process communication of LSSB is disabled if LTE-Mode LightingGroup is ‘OutOfService’

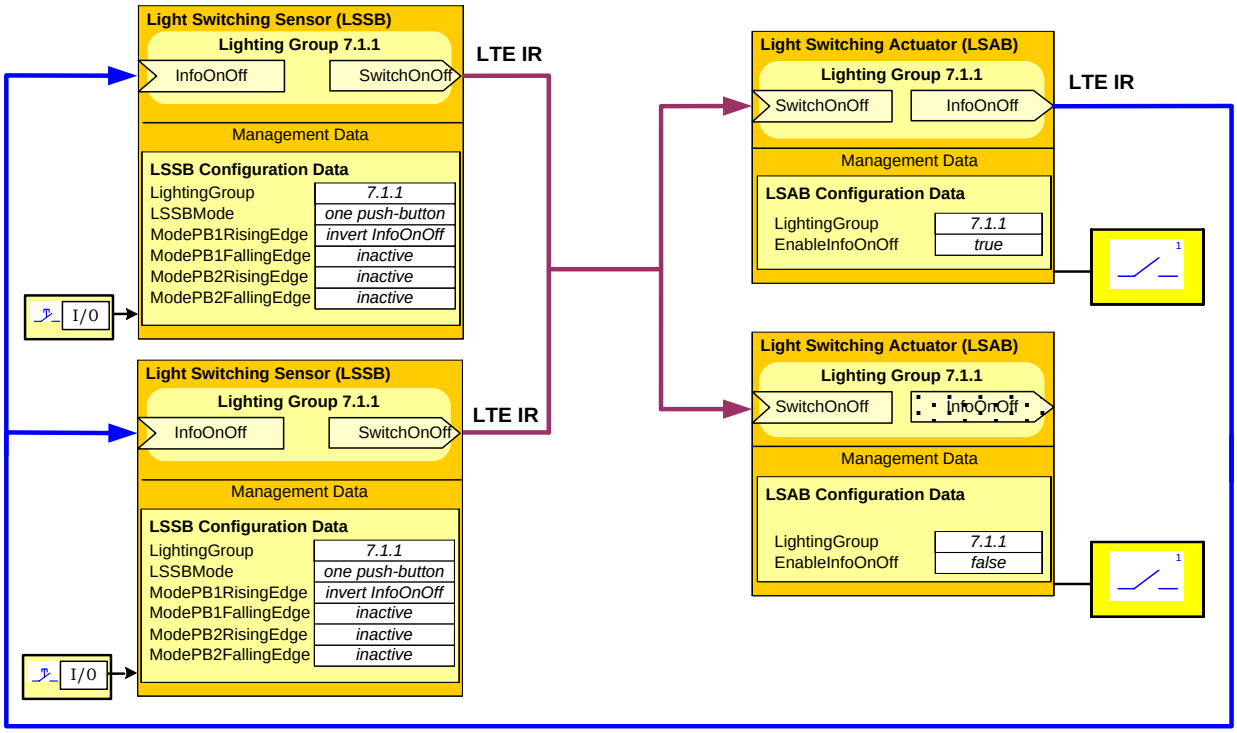

Figure 1 – LSSB with single push-button interface (toggle mode)

This example shows the binding of two parallel light switching sensors LSSB with two parallel light switching actuators LSAB in the same LightingGroup.

Both LSSB are configured to invert the output SwitchOnOff on each transmission according to the received InfoOnOff feedback information (toggle mode). Runtime process data SwitchOnOff is provided by both LSSB and received by both LSAB.

Actuator feedback information InfoOnOff is provided by one LSAB actuator (configured as group-speaker) to support toggle functionality in the LSSB.

NOTE 1 Since both actuators are controlled together, InfoOnOff could in principle be provided by both LSAB. On/Off value of both actuator feedback messages would normally be identical (=> last wins principle on the input in the LSSB). Redundant InfoOnOff messages create unnecessary traffic and should be avoided.

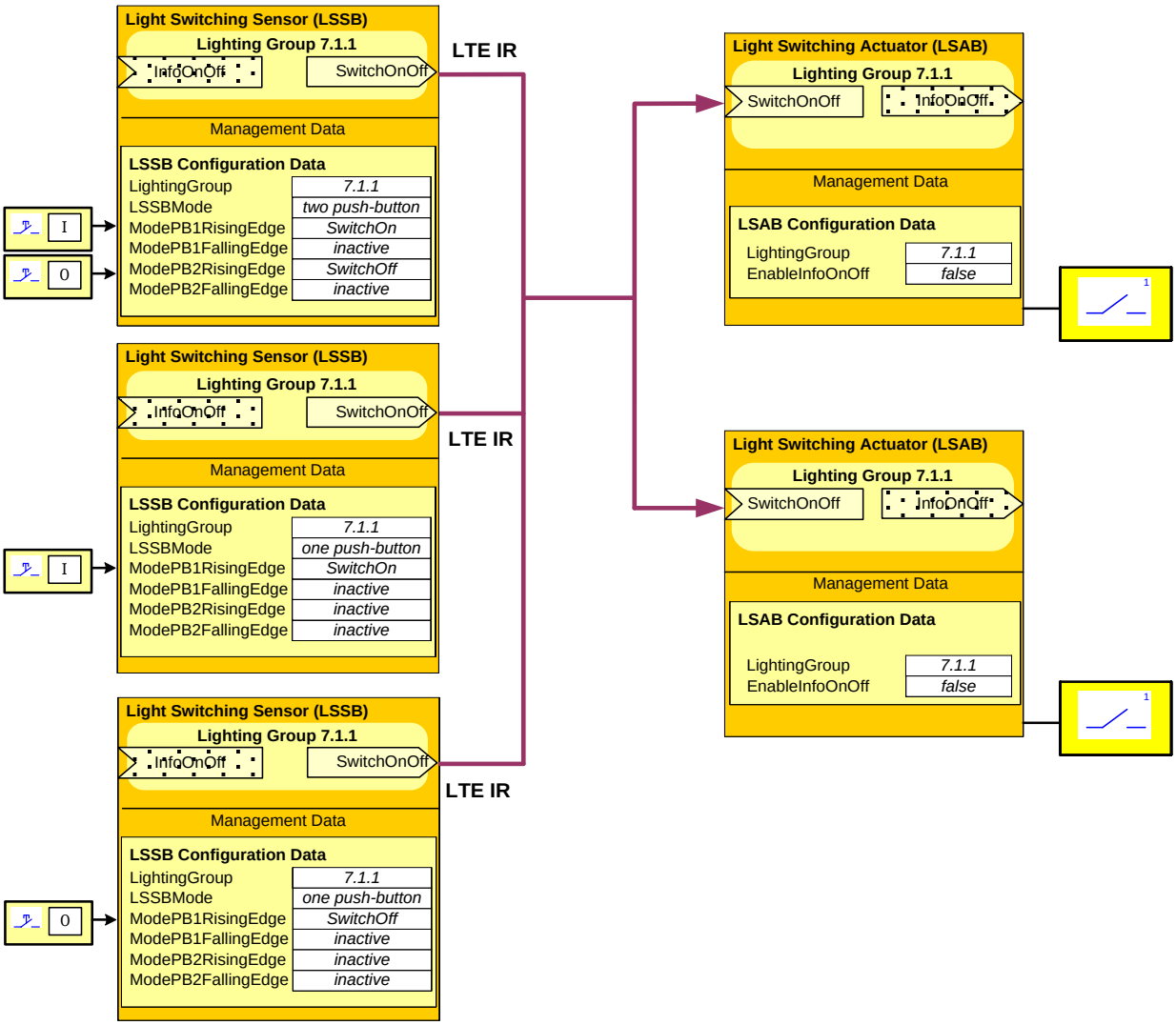

Figure 2 – LSSB with dual push-button interface

This example shows the binding of 3 parallel LSSB with two parallel light switching actuators LSAB in the same LightingGroup (7.1.1):

- one LSSB with dual push-button interface
- one LSSB with single push-button interface sending SwitchOn only
- one LSSB with single push-button interface sending SwitchOff only

None of the LSSB requires InfoOnOff feedback information to implement a toggle function of SwitchOnOff output.

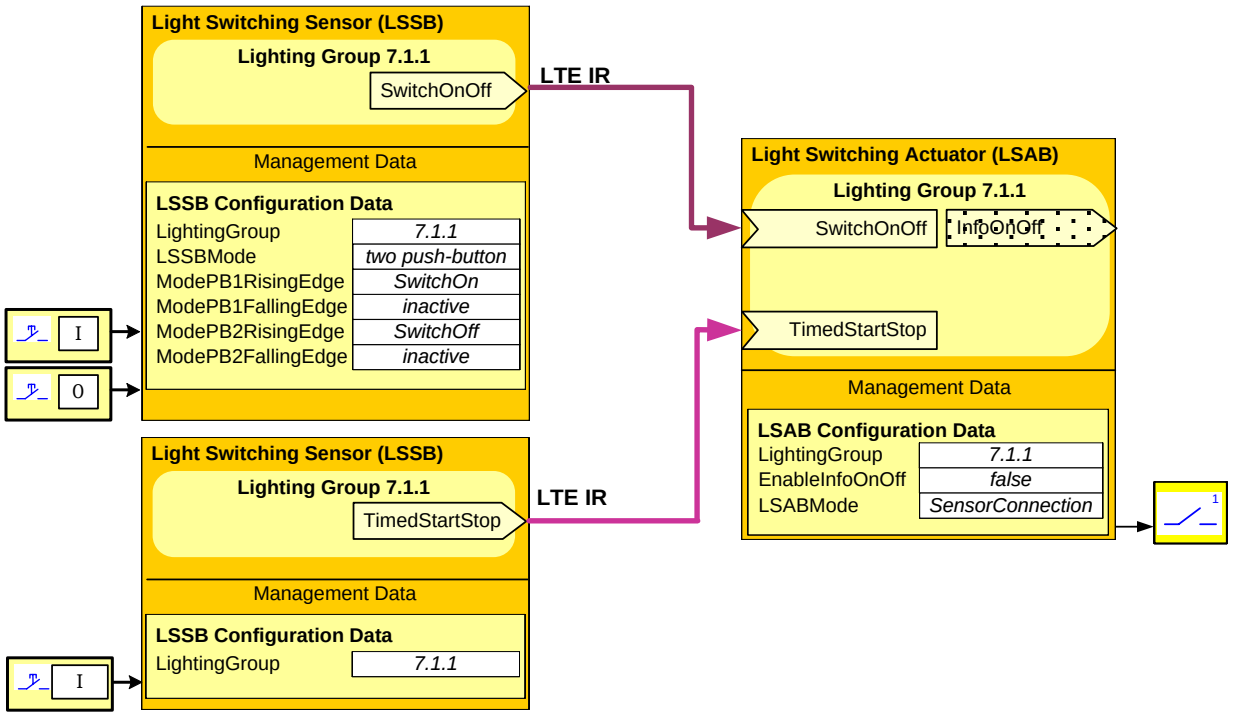

Figure 3 – Autonomous switch-off function via TimedStartStop signal

Figure 3 illustrates the runtime mechanism between LSSB and LSAB to trigger an autonomous switch off function on the LSAB. LSSB may provide an optional, dedicated trigger signal TimedStartStop to implement e.g. a ‘staircase-function’. TimedStartStop is distributed using LTE-Mode InfoReport mechanisms.

Input TimedStartStop on the LSAB will temporarily switch the actuator in the On-state for a defined time. Afterwards LSAB executes an autonomous switch-off function. A manufacturer-specific pre-warning action may be performed.

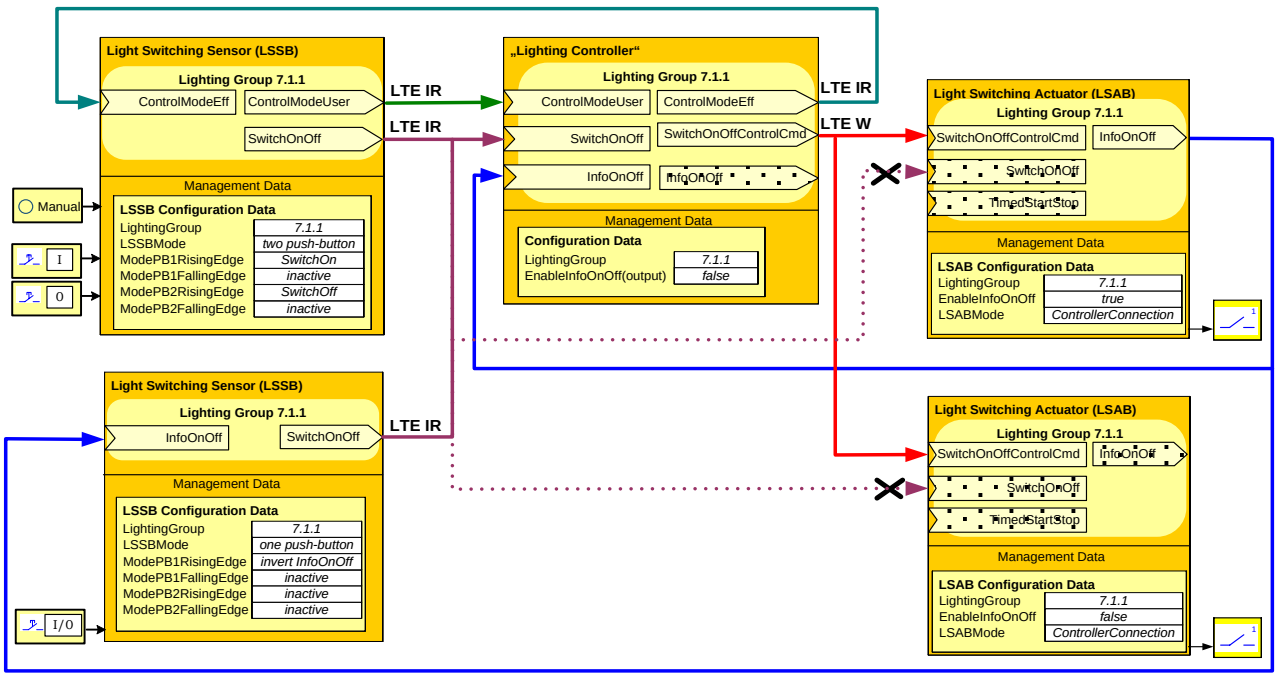

Figure 4 – LSSB - Lighting Controller – LSAB connection

Figure 4 illustrates a light switching application by a Lighting Controller. The LTE-Mode Lighting application model does not define a dedicated ‘Lighting Controller’ FB. The design and runtime interface of the Lighting Controller is manufacturer specific. However in the runtime system, the Lighting Controller shall emulate a Lighting Actuator ‘proxy LSAB’ as the counterpart for the Lighting Sensors.

FB LSSB is connected to a Lighting Controller to notify direct control commands SwitchOnOff requested by the room occupant (manual lighting control).

In addition LSSB may provide the optional signal ControlModeUser representing a request by the user to change from manual to automatic lighting control mode (and vice versa). The Lighting Controller provides the current lighting control mode ControlModeEff (automatic/manual) as optional feedback information for the LSSB.

The Lighting Controller determines the current On/Off setpoint of the lighting actuator according to control commands from LSSB and other criteria (e.g. scheduler, room occupancy etc.). Lighting Controller uses the specific SwitchOnOffControlCmd message to control the On/Off state of the light switching actuator LSAB.

NOTE 2 SwitchOnOff input of the LSAB is used for direct sensor- actuator communication only and deactivated (automatically or via configuration) if LSAB is connected to a Lighting Controller.

1.3 Functional Block diagram

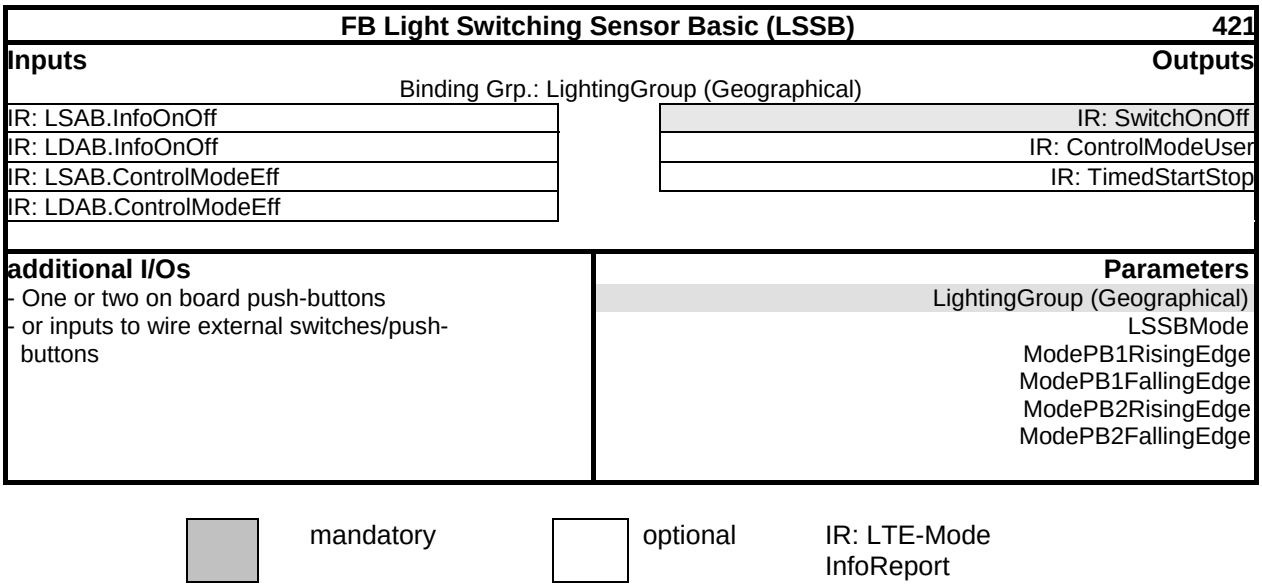

Figure 5 – Functional Block Diagram for FB Light Switching Sensor Basic

1.4 Datapoints

Datapoint	Description	Datapoint Type	LSSB PID
Outputs			
SwitchOnOff	Control signal to switch the light on (=1) or off (=0)	DPT_Switch (1.001)	PID 61
ControlModeUser	Command to request automatic or manual light control by local operation 0: automatic light control 1: manual light control 2 to 255 reserved for future extensions	DPT_LightControl-Mode (20.604)	PID 64
TimedStartStop	Trigger to activate a timed switch on and autonomous switch off function by the actuator	DPT_Start (1.010)	PID 65
Inputs			
LSAB.InfoOnOff LDAB.InfoOnOff	Feedback information from the actuator (LSAB or LDAB) to indicate the binary state of the light: on (=1) or off (=0)	DPT_Switch (1.001)	LSAB PID 51 LDAB PID 51
LSAB.ControlModeEff LDAB.ControlModeEff	Feedback information from a Lighting Controller to indicate whether automatic or manual light control mode is currently active 0: automatic light control 1: manual light control 2 to 255 reserved for future extensions	DPT_LightControl-Mode (20.604)	LSAB PID 54 LDAB PID 54

Parameters			
LightingGroup (3 Properties)	LTE-Mode Geographical Zone - Building zone like Floor, Apartment - Room within the Building zone - Subzone within the Room	- DPT_Ucount-Value8_Z (202.002) - DPT_Ucount-Value8_Z (202.002) - DPT_Ucount-Value8_Z (202.002)	PID 101-103
LSSBMode	Defines the basic behaviour of LSSB: 1: one push button/binary input mode; additional features controlled by ModePB1Rising/FallingEdge 2: two push buttons/binary inputs mode; additional features controlled by ModePB1Rising/FallingEdge and ModePB2Rising/FallingEdge	DPT_SwitchPBModel (20.605)	PID 120
ModePB1RisingEdge	Defines behaviour of SwitchOnOff for a rising edge of push button 1 0: inactive (no message sent) 1: SwitchOff message sent 2: SwitchOn message sent 3: inverse value of InfoOnOff is sent	DPT_PBAction (20.606)	PID 121
ModePB1FallingEdge	Defines behaviour of SwitchOnOff for a falling edge of push button 1 0: inactive (no message sent) 1: SwitchOff message sent 2: SwitchOn message sent 3: inverse value of InfoOnOff is sent	DPT_PBAction (20.606)	PID 122
ModePB2RisingEdge	Defines behaviour of SwitchOnOff for a rising edge of push button 2 0: inactive (no message sent) 1: SwitchOff message sent 2: SwitchOn message sent 3: inverse value of InfoOnOff is sent	DPT_PBAction (20.606)	PID 123
ModePB2FallingEdge	Defines behaviour of SwitchOnOff for a falling edge of push button 2 0: inactive (no message sent) 1: SwitchOff message sent 2: SwitchOn message sent 3: inverse value of InfoOnOff is sent	DPT_PBAction (20.606)	PID 124

Table 1 - LTE-Mode specific Properties

		Support
Parameter	LightingGroup	M

Table 2 - Standard Properties of Interface Object

		Support
Parameter	LSSBMode	O
	ModePB1RisingEdge	O
	ModePB1FallingEdge	O
	ModePB2RisingEdge	O
	ModePB2FallingEdge	O
Diagnostic Data	--	

Configuration of LSSB functionality via parameters LSSBMode and ModePB1Rising/FallingEdge and ModePB2Rising/FallingEdge.

Table 3 - LSSB configuration

	Parameter settings				
LSSB functionality [1]	LSSBMode	ModePB1 RisingEdge	ModePB1 FallingEdge	ModePB2 RisingEdge	ModePB2 FallingEdge
▪ single button, toggle mode	= 1	= 3	= 0	= 0	= 0
▪ single button, send Switch On	= 1	= 2	= 0	= 0	= 0
▪ single button, send Switch Off	= 1	= 1	= 0	= 0	= 0
▪ dual button, - PB1 send Switch On - PB2 send Switch Off	= 2	= 2	= 0	= 1	= 0
▪ dual button, with [2] - PB1 toggle mode - PB2 toggle mode	=2	= 3	= 0	= 3	= 0

[1] In all examples SwitchOnOff message is triggered by PB rising edge

[2] This configuration could only make sense if the 2 PBs are separated in a larger distance from each other and are connected over a common interface.

1.5 Detailed specification of the Datapoints

1.5.1 Output SwitchOnOff

FB: LSSB	**LTE-Mode Server Output Name:** SwitchOnOff	Mandatory ☒ Optional ☐

Description:

Output SwitchOnOff represents control commands to change the On/Off state of light switching/dimming actuators in the same LightingGroup.

DPT:	Name	DPT_Switch	DPT ID	1.001	Datatype format	B_1

Field	Description	Sup.	Range	Unit	COV	Default
b	This field shall indicate whether LSSB requests to switch the light on (1) or off (0)	M	{0, 1}	-	-	-

Communication:

Binding Group:

Class	Type	Default
Geographical ☒	BuildingZone.Room.Subzone	cs (see parameter LightingGroup)
Application Specific ☐		
Unassigned ☐	Broadcast ☐ Configurable ☐	

DP Address:	IO Type(ID): 421 (LSSB)	Property ID: 61
LTE-Mode-Services (event): InfoReport ☒ (LTE-Mode Read-Response polling of the output shall always be supported)	COV ☒ MinRepTime: -- sec	Heartbeat: -- min
	Output per default communicating ☒	Binding Group Wildcard allowed ☒
	Tx Prio: High ☐ Normal ☒ Low ☐	
	Transm after Powerup: Stored Value ☐ Act Value ☐ Default Value ☐	
Property-Service (individual access):	Read only ☒ Read/Write ☐	

Exception Handling:	Save at Powerdown ☐
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Special Features:

- Depending on the parameters ModePB1Rising/FallingEdge and ModePB2Rising/FallingEdge it is possible that only one value of the range is transmitted
- LTE-Mode wildcard features can be used to control e.g. all lighting actuators within the same Room or within the same BuildingZone
- No spontaneous transmission of a default value after power-return. Transmission shall be triggered by user interaction only

1.5.2 Output ControlModeUser

FB: LSSB	**LTE-Mode Server Output Name:** ControlModeUser	Mandatory ☐ Optional ☒

Description:

Output ControlModeUser provides a command to request/release manual light control by local operation. The HMI action to trigger this command is manufacturer specific.
Input ControlModeEff may be used as feedback information to synchronize ControlModeUser values of multiple LSSB in the same zone.

DPT:	Name	DPT_LightControlMode	DPT ID	20.604	Datatype format	N_8

Field	Description	Sup.	Range	Unit	COV	Default
ControlMode	This field shall indicate whether automatic light control (0) or manual light control (1) is requested by the room occupant. Values 2 to 255 are reserved for future extensions	M	0, 1 [1)]	-	-	cs

Communication:

Binding Group:

Class	Type	Default
Geographical ☒	BuildingZone.Room.Subzone	cs (see parameter LightingGroup)
Application Specific ☐		
Unassigned ☐	Broadcast ☐ Configurable ☐	

DP Address:	IO Type(ID):	421 (LSSB)	Property ID:	64
LTE-Mode-Services (event): InfoReport ☒ (LTE-Mode Read-Response polling of the output shall always be supported)	COV ☒	MinRepTime: -- sec	Heartbeat:	-- min
	Output per default communicating ☒		Binding Group Wildcard allowed ☒	
	Tx Prio:	High ☐	Normal ☒	Low ☐
	Transm after Powerup: [2)] Stored Value ☒	Act Value ☐	Default Value ☒	
Property-Service (individual access):	Read only ☒	Read/Write ☐		

Exception Handling:	Save at Powerdown ☐
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Special Features:

[1)] It shall be possible that only one value of the range is transmitted, e.g. to trigger ‘automatic control’ only
[2)] It shall be possible that a default/stored value is transmitted spontaneously after power-return or that LSSB does not send an initial ControlModeUser message after power-return.

1.5.3 Output TimedStartStop

FB: LSSB	**LTE-Mode Server Output Name:** TimedStartStop	Mandatory ☐ Optional ☒

Description:

Output TimedStartStop triggers a timed switch on and autonomous switch off function by the actuator.

DPT:	Name	DPT_Start	DPT ID	1.010	Datatype format	B_1

Field	Description	Sup.	Range	Unit	COV	Default
b	b = 1: triggers the start of the timed switch on and autonomous switch off function b = 0: switch off immediately and stop the timer	M	{0, 1} 1)	-	-	cs

Communication:

Binding Group:

Class	Type	Default
Geographical ☒	BuildingZone.Room.Subzone	cs (see parameter LightingGroup)
Application Specific ☐		
Unassigned ☐	Broadcast ☐ Configurable ☐	

DP Address:	IO Type(ID):	421 (LSSB)	Property ID:	65
LTE-Mode-Services (event): InfoReport ☒ (LTE-Mode Read-Response polling of the output shall always be supported)	COV ☒	MinRepTime: -- sec	Heartbeat: -- min	
	Output per default communicating ☒		Binding Group Wildcard allowed ☒	
	Tx Prio:	High ☐	Normal ☒	Low ☐
	Transm after Powerup: Stored Value ☐	Act Value ☐	Default Value ☐	
Property-Service (individual access):	Read only ☒	Read/Write ☐		

Exception Handling: Save at Powerdown ☐

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Special Features:

1) It shall be possible that only one value of the range is transmitted, e.g. to trigger ‘start’ only

No spontaneous transmission of a default value after power-return. Transmission shall be triggered by user interaction only

1.5.4 Input InfoOnOff

FB:	LSSB	LTE-Mode Client Input Name:	InfoOnOff	Mandatory ☐ Optional ☒

Description:

Input InfoOnOff is used to receive the On/Off status of the corresponding switching (LSAB) or dimming (LDAB) actuator(s) in the same zone.
This information can be used solely for visualization purposes, for implementing the toggle functionality of SwitchOnOff output or for other purposes.

DPT:	Name	DPT_Switch	DPT ID	1.001	Datatype format	B_1

Field	Description	Sup.	Unit	Default
b	indicates the switching status of the lighting actuator On (1) or Off (0) In case of dimming actuator: - 0: light off - 1: light on or dimmed > 0 %	M	--	Off

Communication:

Binding Group:

Class	Type	Default
Geographical ☒	BuildingZone.Room.Subzone	cs (see parameter LightingGroup)
Application Specific ☐		
Unassigned ☐	Broadcast ☐ Configurable ☐	

DP Address:	IO Type(ID):	417 (LSAB) 418 (LDAB)	Property ID:	51
LTE-Mode-Service (event): InfoReport ☒	InfoReport Sniffer on Binding Group:	--		
	Timeout:	--	Min	
LTE-Mode-Service (polling): Read – Response ☐	Read Wildcard / Resp Sniffer on Binding Group:	--		

Value after Powerup: Default Value ☒ Stored Value ☐

Exception Handling: Save at Powerdown ☐

If this DP is not received (communication failure or configuration mistake) and the toggle functionality is activated, then output SwitchOnOff will still toggle

Special Features:

If multiple actuators are operated in the same zone, each actuator may send its own InfoOnOff message. Since all actuators in the same zone are controlled together, subsequent InfoOnOff feedback messages are normally identical => last wins principle on the LSSB input
However it is highly recommended to configure one actuator in the zone as InfoOnOff Group Speaker

1.5.5 Input ControlModeEff

FB: LSSB	**LTE-Mode Client Input Name:**	ControlModeEff	Mandatory ☐ Optional ☒

Description:

Input ControlModeEff is provided by a Lighting Controller to indicate if manual or automatic lighting control is currently active in the zone.
This information can be used solely for visualization purposes, or to synchronize ControlModeUser values of multiple LSSB in the same zone, or for other purposes.

DPT:	Name	DPT_LightControlMode	DPT ID	20.604	Datatype format	N_8

Field	Description	Sup.	Unit	Default
b	This field shall indicate whether automatic light control (0) or manual light control (1) is currently active values 2 to 255 are reserved for future extensions	M	--	cs

Communication:

Binding Group:

Class	Type	Default
Geographical ☒	BuildingZone.Room.Subzone	cs (see parameter LightingGroup)
Application Specific ☐		
Unassigned ☐	Broadcast ☐ Configurable ☐	

DP Address:	IO Type(ID):	417 (LSAB) 418 (LDAB)	Property ID:	54
LTE-Mode-Service (event): InfoReport ☒	InfoReport Sniffer on Binding Group:	--		
	Timeout:	--	Min	
LTE-Mode-Service (polling): Read – Response ☐	Read Wildcard / Resp Sniffer on Binding Group:	--		

Value after Powerup: Default Value ☒ Stored Value ☐

Exception Handling: Save at Powerdown ☐

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Special Features:

ControlModeEff feedback from a Lighting Controller is represented in the LTE-Mode runtime system as an InfoReport from an LSAB or LDAB. From the perspective of the LSSB the Lighting Controller behaves like a lighting actuator proxy to emulate traditional direct sensor – actuator communication.

1.5.6 Parameter-set LightingGroup

LightingGroup is implemented using the LTE-Mode Geographical zone concept. It consists of 3 properties belonging together.

1.5.6.1 Parameter BuildingZone

FB: LSSB	**Property Name (Server):** LightingGroup.BuildingZone	Mandatory ☒ Optional ☐

Description:

Part of LightingGroup parameter set mapped to LTE-Mode Geographical zone:
-> BuildingEntity (Floor, Apartment, Building section etc.)

DPT:	Name	DPT_UcountValue8_Z	DPT ID	202.002	Datatype format	U_8Z_8

Field	Description	Sup.	Range	Unit	Default
CounterValue	Number of the BuildingZone	M	1 to 126	--	cs
Status - OutOfService - all other flags	 zone active /inactive not supported, fixed to '0'	 O NA	 true/false	Bitset	 cs
Command - NormalWrite - SetOSV & ResetOSV - all other commands	 set zone inactive / active not supported	 M O NA		Enum	

Communication:

DP Address:	IO Type(ID):	421 (LSSB)	Property ID:	101
(in the server)	Start-Index:	1	N° of elements	1
Property access:	Read only ☐		Read/Write ☒	
Protection	Read level	--	Write level	--

Exception Handling: Value after Powerup: Stored Value ☒ Act Value ☐ Default Value ☐

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Special Features:

LSSB LTE-Mode runtime interface is deactivated if zone is 'OutOfService'. If parameter BuildingZone is 'OutOfService' also the corresponding Room and Subzone parameters are 'OutOfService' (common flag)

1.5.6.2 Parameter Room

FB: LSSB	Property Name (Server):	LightingGroup.Room	Mandatory ☒ Optional ☐

Description:

Part of LightingGroup parameter set mapped to LTE-Mode Geographical zone:
-> Room within BuildingZone

DPT:	Name	DPT_UcountValue8_Z	DPT ID	202.002	Datatype format	U_8Z_8

Field	Description	Sup.	Range	Unit	Default
CounterValue	Room number	M	1 to 63	--	cs
Status - OutOfService - all other flags	 zone active /inactive not supported, fixed to '0'	 O NA	 true/false	bitset	cs
Command - NormalWrite - SetOSV & ResetOSV - all other commands	 set zone inactive / active not supported	 M O NA		enum	

Communication:

DP Address:	IO Type(ID):	421 (LSSB)	Property ID:	102
(in the server)	Start-Index:	1	N° of elements	1
Property access:	Read only ☐		Read/Write ☒	
Protection	Read level	--	Write level	--

Exception Handling: Value after Powerup: Stored Value ☒ Act Value ☐ Default Value ☐

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Special Features:

LSSB LTE-Mode runtime interface is deactivated if zone is 'OutOfService'. If parameter BuildingZone is 'OutOfService' also the corresponding Room and Subzone parameters are 'OutOfService' (common flag)

1.5.6.3 Parameter Subzone

FB: LSSB	Property Name (Server):	LightingGroup.Subzone	Mandatory ☒ Optional ☐

Description:

Part of LightingGroup parameter set mapped to LTE-Mode Geographical zone:
-> Subzone within BuildingZone.Room

DPT:	Name	DPT_UcountValue8_Z	DPT ID	202.002	Datatype format	U_8Z_8

Field	Description	Sup.	Range	Unit	Default
CounterValue	Subzone number	M	1 to 15	--	cs
Status - OutOfService - all other flags	 zone active /inactive not supported, fixed to '0'	 O NA	 true/false	bitset	cs
Command - NormalWrite - SetOSV & ResetOSV - all other commands	 set zone inactive / active not supported	 M O NA		enum	

Communication:

DP Address:	IO Type(ID):	421 (LSSB)	Property ID:	103
(in the server)	Start-Index:	1	N° of elements	1
Property access:	Read only ☐		Read/Write ☒	
Protection	Read level	--	Write level	--

Exception Handling: Value after Powerup: Stored Value ☒ Act Value ☐ Default Value ☐

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Special Features:

LSSB LTE-Mode runtime interface is deactivated if zone is 'OutOfService'. If parameter BuildingZone is 'OutOfService' also the corresponding Room and Subzone parameters are 'OutOfService' (common flag)

1.5.7 Parameter LSSBMode

FB: LSSB	**Property Name (Server):** LSSBMode	Mandatory ☐ Optional ☒

Description:

This parameter selects the basic behavior of the LSSB in regards to the push-button interface used for light switching. This parameter is meaningful if conventional push-buttons/switches are connected to the light dimming sensor.
Two models are supported:
- light switching (toggle mode) with one push-button
- light switching with two push-button: one button used to switch on the light; the other button used to switch off the light

DPT:	Name	DPT_SwitchPBModel	DPT ID	20.605	Datatype format	N_8

Field	Description	Sup.	Range	Unit	Default
	1: one push button/binary input mode; additional features controlled by ModePB1Rising/FallingEdge 2: two push buttons/binary inputs mode; additional features controlled by ModePB1Rising/FallingEdge and ModePB2Rising/FallingEdge		cs		Cs

Communication:

DP Address:	IO Type(ID):	421 (LSSB)	Property ID:	120
(in the server)	Start-Index:	1	N° of elements	1
Property access:	Read only ☐		Read/Write ☒	
Protection	Read level	--	Write level	--

Exception Handling: Value after Powerup: Stored Value ☒ Act Value ☐ Default Value ☐

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Special Features:

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1.5.8 Parameter ModePB1RisingEdge

FB: LSSB	**Property Name (Server):** ModePB1RisingEdge	Mandatory ☐ Optional ☒

Description:

This parameter specifies the behavior of SwitchOnOff output on detection of a rising edge at push button input 1

DPT:	Name	DPT_PBAction	DPT ID	20.606	Datatype format	N_8

Field	Description	Sup.	Range	Unit	Default
	0: no SwitchOnOff message sent 1: SwitchOnOff = Off message is sent 2: SwitchOnOff = On message is sent 3: SwitchOnOff = inverse value of InfoOnOff is sent		cs		cs

Communication:

DP Address:	IO Type(ID):	421 (LSSB)	Property ID:	121
(in the server)	Start-Index:	1	N° of elements	1
Property access:	Read only ☐		Read/Write ☒	
Protection	Read level	--	Write level	--

Exception Handling: Value after Powerup: Stored Value ☒ Act Value ☐ Default Value ☐

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Special Features:

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1.5.9 Parameter ModePB1FallingEdge

FB: LSSB	**Property Name (Server):**	ModePB1FallingEdge	Mandatory ☐ Optional ☒

Description:

This parameter specifies the behaviour of SwitchOnOff output on detection of a falling edge at push button input 1

DPT:	Name	DPT_PBAction	DPT ID	20.606	Datatype format	N_8

Field	Description	Sup.	Range	Unit	Default
	0: no SwitchOnOff message sent 1: SwitchOnOff = Off message is sent 2: SwitchOnOff = On message is sent 3: SwitchOnOff = inverse value of InfoOnOff is sent		cs		cs

Communication:

DP Address:	IO Type(ID):	421 (LSSB)	Property ID:	122
(in the server)	Start-Index:	1	N° of elements	1
Property access:	Read only ☐		Read/Write ☒	
Protection	Read level	--	Write level	--

Exception Handling: Value after Powerup: Stored Value ☒ Act Value ☐ Default Value ☐

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Special Features:

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1.5.10 Parameter ModePB2RisingEdge

FB: LSSB	**Property Name (Server):**	ModePB2RisingEdge	Mandatory ☐ Optional ☒

Description:

This parameter specifies the behavior of SwitchOnOff output on detection of a rising edge at push button input 2

DPT:	Name	DPT_PBAction	DPT ID	20.606	Datatype format	N_8

Field	Description	Sup.	Range	Unit	Default
	0: no SwitchOnOff message sent 1: SwitchOnOff = Off message is sent 2: SwitchOnOff = On message is sent 3: SwitchOnOff = inverse value of InfoOnOff is sent *)		cs		cs

Communication:

DP Address:	IO Type(ID):	421 (LSSB)	Property ID:	123
(in the server)	Start-Index:	1	N° of elements	1
Property access:	Read only ☐		Read/Write ☒	
Protection	Read level	--	Write level	--

Exception Handling: Value after Powerup: Stored Value ☒ Act Value ☐ Default Value ☐

--

Special Features:

The value of this parameter is only meaningful if 2 buttons are used to switch on/off the light; i.e. LSSBMode = 2: two push buttons/binary inputs

*) this configuration could only make sense if the 2 PBs are separated in a larger distance from each other and are connected over a common interface

1.5.11 Parameter ModePB2FallingEdge

FB: LSSB	**Property Name (Server):** ModePB2FallingEdge	Mandatory ☐ Optional ☒

Description:

This parameter specifies the behavior of SwitchOnOff output on detection of a falling edge at push button input 2

DPT:	Name	DPT_PBAction	DPT ID	20.606	Datatype format	N_8

Field	Description	Sup.	Range	Unit	Default
	0: no SwitchOnOff message sent 1: SwitchOnOff = Off message is sent 2: SwitchOnOff = On message is sent 3: SwitchOnOff = inverse value of InfoOnOff is sent *)		cs		cs

Communication:

DP Address:	IO Type(ID):	421 (LSSB)	Property ID:	124
(in the server)	Start-Index:	1	N° of elements	1
Property access:	Read only ☐		Read/Write ☒	
Protection	Read level	--	Write level	--

Exception Handling: Value after Powerup: Stored Value ☒ Act Value ☐ Default Value ☐

--

Special Features:

The value of this parameter is only meaningful if 2 buttons are used to switch on/off the light; i.e. LSSBMode = 2: two push buttons/binary inputs

*) this configuration could only make sense if the 2 PBs are separated in a larger distance from each other and are connected over a common interface

2 FB Light Dimming Sensor Basic (LDSB)

2.1 Aims and objectives

The definitions in this document for FB Light Dimming Sensor Basic (LDSB) are an add-on to the existing FB Specification in [01] to describe the LTE-Mode runtime interface and LTE-Mode specific parameters of FB LDSB.

It specifies the functionality of FB LDSB, for example contained in a switch or a push button, to increase or decrease the brightness of a lamp or to switch the lamp on/off.

The FB LDSB is used in the Application Domain Lighting to notify light control commands to:

- control dimming actuators (traditional direct sensor – actuator communication)
- or to provide light dimming sensor data to a Lighting Controller (sensor – controller – actuator communication)

The inputs and outputs of FB LDSB are specified in this document but not the Human Machine Interface (HMI). Consequently, the manufacturers of the button or switch have the possibility to implement their design and their operation methods.

2.2 Functional specification

2.2.1 Overview

The FB Light Dimming Sensor Basic

- provides hardwired inputs or local button/HMI functionality to trigger output messages to control
  - the switching/dimming status of FB Light Dimming Actuator Basic (LDAB)
  - or the On/Off status of FB Light Switching Actuator Basic (LSAB)
- receives status feedback messages from light switching/dimming actuators according to the FB specification in [01]

Binding of LDSB with FBs LSAB / LDAB is based on LTE-Mode zoning concepts. Control and status feedback information are exchanged according to LTE-Mode mechanisms in a common LightingGroup.

In the LTE-Mode runtime system LightingGroup is mapped to existing LTE-Mode Geographical zones.

Runtime process communication of LDSB is disabled if LTE-Mode LightingGroup is ‘OutOfService’

Three mechanisms are provided in the LDSB model to implement the dimming function between LDSB and LDAB:

- the setpoint value of the dimmer is increased and decreased starting from the current value via combined start/stop and increase/decrease command attributes in the RelSetvalueControl output
- the setpoint value of the dimmer is increased and decreased in relative steps starting from the current value via step increase/decrease attributes in the RelSetvalueControl output
- the setpoint value of the dimmer is directly controlled through the output AbsSetvalueControl.

All models can be combined in a LDSB implementation.

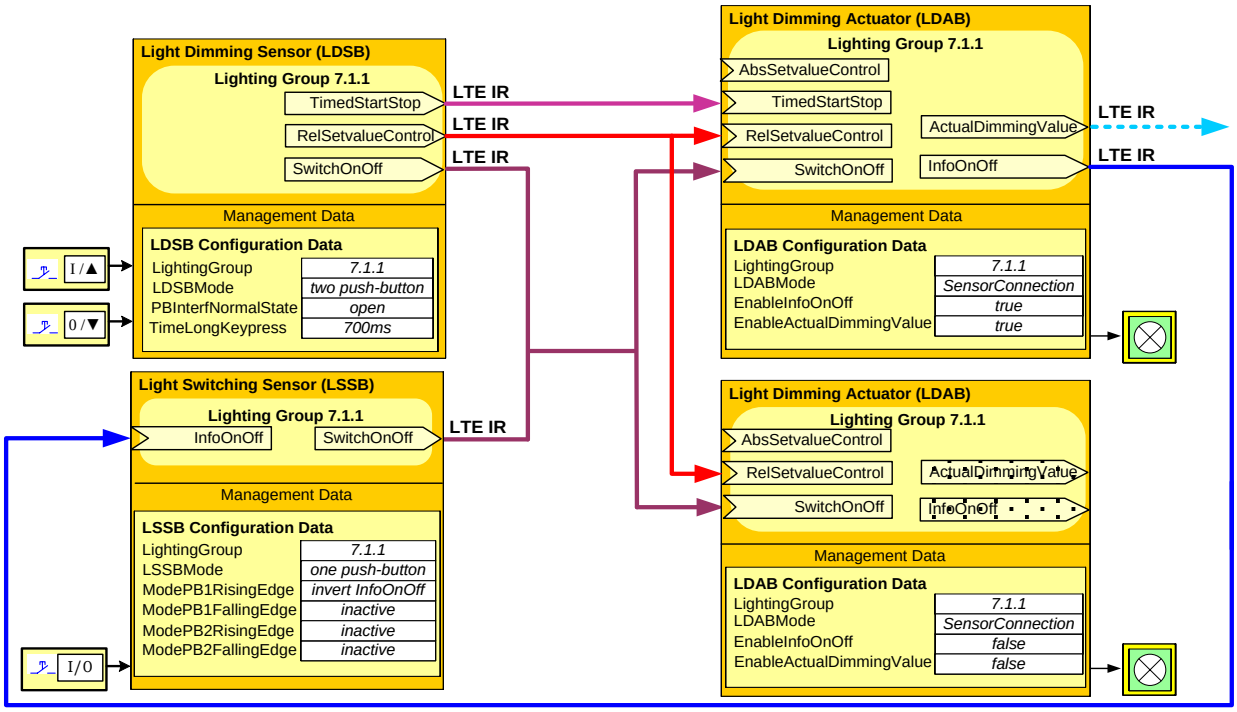

Figure 6 – Example of direct sensor - actuator binding

Figure 6 illustrates the binding of parallel Light Switching/Dimming Sensors LSSB/LDSB with two parallel Light Dimming Actuators LDAB in the same LightingGroup.

LDSB is configured to be operated via 2 push-buttons or binary inputs.

- one push-button / binary input to switch the lamp On and increase the dimming setpoint value
- one push-button / binary input to switch the lamp Off and decrease the dimming setpoint value

Both LSSB and LDSB control the light On/Off state via SwitchOnOff command. RelSevalueControl is provided by the LDSB to start/stop dimming up/down. SwitchOnOff and RelSetvalueControl commands are sent using LTE-Mode InfoReport Service and are received by both LDAB in the same LightingGroup.

LDSB may provide an optional, dedicated trigger signal TimedStartStop to implement e.g. a ‘staircase-function’ in the actuator. TimedStartStop is distributed using LTE-Mode InfoReport mechanisms.

Input TimedStartStop on the LDAB will temporarily switch the actuator in the On-state for a defined time. Afterwards LDAB executes an autonomous switch-off function.

Actuator feedback information InfoOnOff could in principle be provided by both LDAB to support e.g. the toggle functionality in the LSSB. However, in the example above InfoOnOff is provided by LDAB only (configured as Group Speaker).

NOTE 3 Since both actuators are controlled together, On/Off value of both actuator feedback messages would normally be identical (=> last wins principle on the input in the LSSB). Redundant InfoOnOff messages create unnecessary traffic and should be avoided.

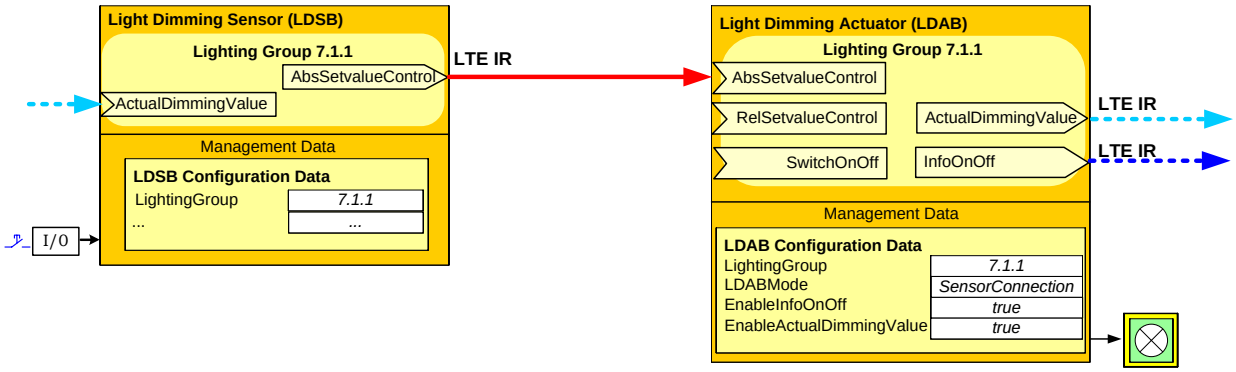

Figure 7 – Direct control of the absolute dimming value

Figure 7 illustrates the runtime interworking mechanisms between a LDSB and a LDAB with the purpose to directly control the absolute dimming value (% value) of the actuator.

Control command AbsSetvalueControl is provided by the LDSB using LTE-Mode InfoReport Service and received by the LDAB in the same LightingGroup.

LDAB may provide feedback information ActualDimmingValue representing the current lighting level (% value) of the actuator. This information may be useful on the LDSB for visualization for any other purpose.

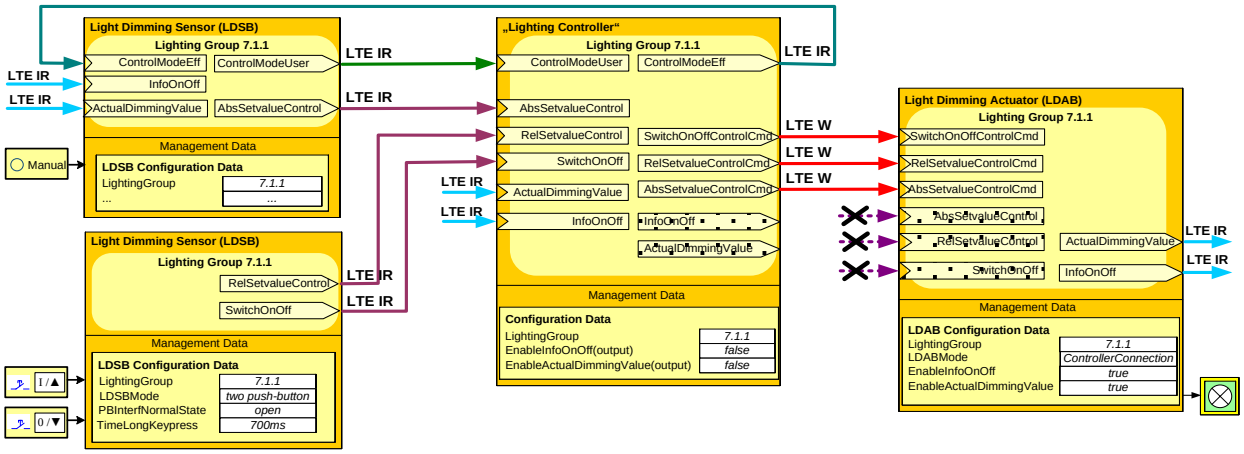

Figure 8 – LDSB - Lighting Controller – LDAB connection

Figure 8 illustrates a light dimming application by a Lighting Controller. The LTE-Mode Lighting application model does not define a dedicated ‘Lighting Controller’ FB. The design and runtime interface of the Lighting Controller is manufacturer specific. However in the runtime system, the Lighting Controller shall emulate a Lighting Actuator “proxy LDAB” as the counterpart for the Lighting Sensors LDSB.

FB LDSB is connected to a Lighting Controller to notify control commands SwitchOnOff, RelSetvalueControl, AbsSetvalueControl requested by the room occupant (manual lighting control).

Inputs SwitchOnOff, RelSetvalueControl and AbsSetvalueControl on the Lighting Controller are usually processed with the same priority (last wins principle).

In addition LDSB may provide the optional signal ControlModeUser representing a request by the user to change from manual to automatic lighting control mode (and vice versa). The Lighting Controller provides the current lighting control mode ControlModeEff (automatic/manual) as optional feedback information for the LDSB.

The Lighting Controller determines the resulting control command to change the setpoint of the connected LDAB according to control commands from the LDSB and other criteria (e.g. scheduler, room occupancy etc.).

2.3 Functional Block diagram

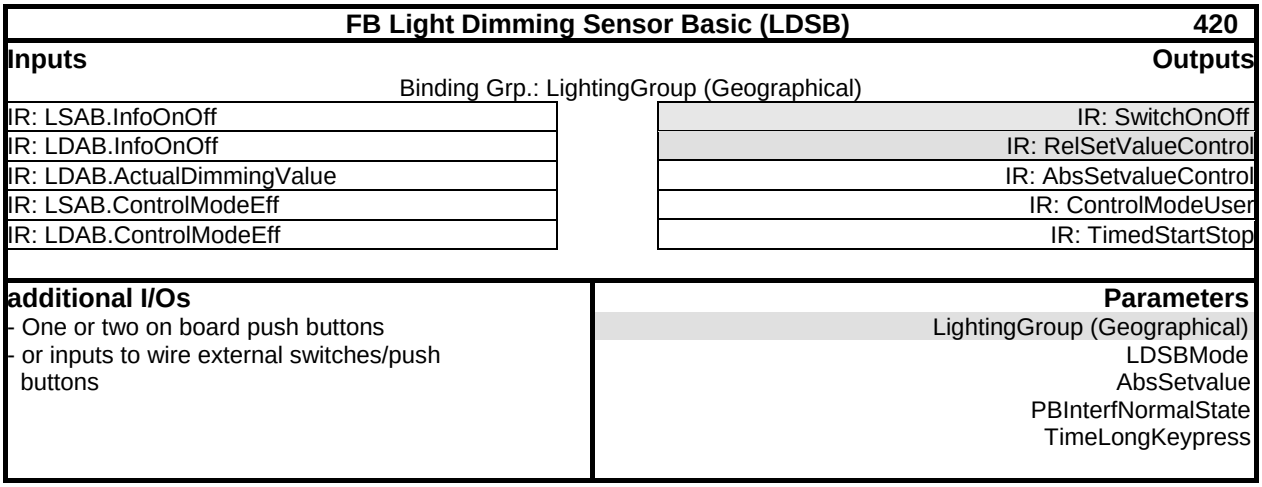

Figure 9 – Functional Block Diagram for FB Light Dimming Sensor Basic

2.4 Datapoints

Datapoint	Description	Datapoint Type	LDSB PID
Outputs			
SwitchOnOff	Control signal to switch the light on (=1) or off (=0)	DPT_Switch (1.001)	PID 61
RelSetvalueControl	Control signal: - to increase/decrease the setpoint of the dimming actuator starting from the current dimming level - and to stop dimming	DPT_Control_-Dimming (3.007)	PID 62
AbsSetvalueControl	Signal to directly control the setpoint of the dimming actuator	DPT_Scaling (5.001)	PID 63
ControlModeUser	Command to request automatic or manual light control by local operation - 0: automatic light control - 1: manual light control - 2 to 255 reserved for future extensions	DPT_LightControl-Mode (20.604)	PID 64
TimedStartStop	Trigger to activate a timed switch on and autonomous switch off function by the actuator	DPT_Start (1.010)	PID 65

Datapoint	Description	Datapoint Type	LDSB PID
Inputs			
LSAB.InfoOnOff LDAB.InfoOnOff	Feedback information from the actuator (LSAB or LDAB) to indicate the binary state of the light: on (=1) or - off (=0)	DPT_Switch (1.001)	LSAB PID 51 LDAB PID 51
LSAB.ControlModeEff LDAB.ControlModeEff	Feedback information from a Lighting Controller to indicate whether automatic or manual light control mode is currently active - 0: automatic light control - 1: manual light control - 2 to 255 reserved for future extensions	DPT_LightControl-Mode (20.604)	LSAB PID 54 LDAB PID 54
LDAB.ActualDimming-Value	Feedback information from the actuator to indicate the actual dimming	DPT_Scaling (5.001)	LDAB PID 52
Parameters			
LightingGroup (3 Properties)	LTE-Mode Geographical Zone - Building zone like Floor, Apartment - Room within the Building zone - Subzone within the Room	- DPT_Ucount-Value8_Z (202.002) - DPT_Ucount-Value8_Z (202.002) - DPT_Ucount-Value8_Z (202.002)	PID 101-103
LDSBMode	Defines the basic behaviour of LDSB: 1: one push button/binary input; SwitchOnOff inverts on each transmission 2: one push button/binary input, On / DimUp message sent 3: one push button/binary input, Off / DimDown message sent 4: two push buttons/binary inputs mode	DPT_DimmPBModel (20.607)	PID 120
PBInterfNormalState	Defines normally open/closed behaviour of push button interface - 0: open - 1: closed	DPT_OpenClose (1.009)	PID121
TimeLongKeypress	Time to detect long key press 0,3 s to 7 s 100 ms resolution	DPT_TimePeriod100 msec (7.004)	PID122
AbsSetvalue	Default value for the output AbsSetvalueControl	DPT_Scaling (5.001)	PID 123

Table 4 - LTE-Mode specific Properties

		Support
Parameter	LightingGroup	M

Table 5 - Standard Properties of Interface Object

		Support
Parameter	LDSBMode	O
	PBInterfNormalState	O
	TimeLongKeypress	O
	AbsSetvalue	O
Diagnostic Data	--	

2.5 Detailed specification of the Datapoints

2.5.1 Output SwitchOnOff

FB: LDSB	**LTE-Mode Server Output Name:** SwitchOnOff	Mandatory ☒ Optional ☐

Description:

Output SwitchOnOff represents control commands to change the On/Off state of light switching/dimming actuators in the same LightingGroup.

DPT:	Name	DPT_Switch	DPT ID	1.001	Datatype format	B_1

Field	Description	Sup.	Range	Unit	COV	Default
b	This field shall indicate whether the LDSB requests to switch the light on (1) or off (0)	M	{0, 1}	-	-	-

Communication:

Binding Group:

Class	Type	Default
Geographical ☒	BuildingZone.Room.Subzone	cs (see parameter LightingGroup)
Application Specific ☐		
Unassigned ☐	Broadcast ☐ Configurable ☐	

DP Address:	IO Type(ID):	420 (LDSB)	Property ID:	61
LTE-Mode-Services (event): InfoReport ☒ (LTE-Mode Read-Response polling of the output shall always be supported)	COV ☒	MinRepTime: -- sec	Heartbeat:	-- min
	Output per default communicating ☒		Binding Group Wildcard allowed ☒	
	Tx Prio:	High ☐	Normal ☒	Low ☐
	Transm after Powerup: Stored Value ☐	Act Value ☐	Default Value ☐	
Property-Service (individual access):	Read only ☒	Read/Write ☐		

Exception Handling: Save at Powerdown ☐

--

Special Features:

- Depending on the parameter LDSBMode it is possible that only one value of the range is transmitted
- LTE-Mode wildcard features can be used to control e.g. all lighting actuators within the same Room or within the same BuildingZone
- No spontaneous transmission of a default value after power-return. Transmission shall be triggered by user interaction only

2.5.2 Output RelSetvalueControl

FB: LDSB	**LTE-Mode Server Output Name:** RelSetvalueControl	Mandatory ☒ Optional ☐

Description:

Output RelSetvalueControl provides information to increase/decrease the setpoint of the dimming actuator. RelSetvalueControl supports two mechanisms to implement the dimming function between LDSB and LDAB:

- the setpoint value of the dimmer is increased and decreased starting from the current value via combined start/stop and increase/decrease command attributes
  - c field: 0 = dim down / 1 = dim up
  - StepCode field: 000b = Stop dimming
  - StepCode field: 001b = Start dimming in the full dimming range

  This is the recommended LDSB behaviour
- the setpoint value of the dimmer is increased and decreased in relative steps starting from the current value via step increase/decrease attributes in the RelSetvalueControl output. Each transmission of RelSetvalueControl triggers one dimming step in the actuator
  - c field: 0 = dim down / 1 = dim up
  - StepCode field: 000b = Stop dimming
  - StepCode field: x, with x >001b = Start dimming with a predefined step increment

  x: 010b… 111b indicates the number of intervals into which the dimming range of 0 % to 100 % is subdivided. Number of intervals = $2^{(stepcode-1)}$

  e.g. StepCode = 100b => number of intervals = 8 => 1 step = 12.5 %

  The following intervals can be encoded: 50 %, 25 %, 12,5 %, 6,25 %, 3,12 % and 1,625 %

DPT:	Name	DPT_Control_Dimming	DPT ID	3.007	Datatype format	B_1U_3

Field	Description	Sup.	Range	Unit	COV	Default
c	Dimming direction: up (1) / down (0)	M	{0, 1}	-	-	-
StepCode	Start/Stop commands and number of step intervals respectively are encoded; see above	M	[000b to 111b]	-	-	-

Communication:

Binding Group:

Class	Type	Default
Geographical ☒	BuildingZone.Room.Subzone	cs (see parameter LightingGroup)
Application Specific ☐		
Unassigned ☐	Broadcast ☐ Configurable ☐	

DP Address:	IO Type(ID):	420 (LDSB)	Property ID:	62
LTE-Mode-Services (event): InfoReport ☒ (LTE-Mode Read-Response polling of the output shall always be supported)	COV ☒	MinRepTime: -- sec	Heartbeat: -- min	
	Output per default communicating ☒		Binding Group Wildcard allowed ☒	
	Tx Prio:	High ☐	Normal ☒	Low ☐
	Transm after Powerup: Stored Value ☐	Act Value ☐	Default Value ☐	
Property-Service (individual access):	Read only ☒		Read/Write ☐	

Exception Handling: Save at Powerdown ☐

--

Special Features:

- Depending on the parameter LDSBMode it is possible that only one value of the field c is transmitted. I.e. LDSB only sends commands to dim up or to dim down.
- LTE-Mode wildcard features can be used to control e.g. all lighting actuators within the same Room or within the same BuildingZone
- No spontaneous transmission of a default value after power-return. Transmission shall be triggered by user interaction only

2.5.3 Output AbsSetvalueControl

FB: LDSB	**LTE-Mode Server Output Name:** AbsSetvalueControl	Mandatory ☐ Optional ☒

Description:

Output AbsSetvalueControl provides control information to set the absolute dimming level of the actuator. The algorithm to calculate the value of this output is not standardised. It may be predefined by the configuration parameter AbsSetvalue.
If parameter LDSB is configured to send dim down/switch off commands only, then it is recommended that output AbsSetvalueControl is deactivated or the output value is fixed 0 %.

DPT:	Name	DPT_Scaling	DPT ID	5.001	Datatype format	U_8

Field	Description	Sup.	Range	Unit	COV	Default
SetValue	Dimming actuator setpoint in %	M	[0 % to 100 %]	%	cs	-

Communication:

Binding Group:

Class	Type	Default
Geographical ☒	BuildingZone.Room.Subzone	cs (see parameter LightingGroup)
Application Specific ☐		
Unassigned ☐	Broadcast ☐ Configurable ☐	

DP Address:	IO Type(ID):	420 (LDSB)	Property ID:	63
LTE-Mode-Services (event): InfoReport ☒ (LTE-Mode Read-Response polling of the output shall always be supported)	COV ☒	MinRepTime: -- sec	Heartbeat: -- min	
	Output per default communicating ☒		Binding Group Wildcard allowed ☒	
	Tx Prio:	High ☐	Normal ☒	Low ☐
	Transm after Powerup: Stored Value ☐	Act Value ☐	Default Value ☐	
Property-Service (individual access):	Read only ☒		Read/Write ☐	

Exception Handling:	Save at Powerdown ☐
--	

Special Features:

- LTE-Mode wildcard features can be used to control e.g. all lighting actuators within the same Room or within the same BuildingZone
- No spontaneous transmission of a default value after power-return. Transmission shall be triggered by user interaction only

2.5.4 Output ControlModeUser

FB: LDSB	**LTE-Mode Server Output Name:** ControlModeUser	Mandatory ☐ Optional ☒

Description:

Output LightControlModeUser provides a command to request/release manual light control by local operation.
The HMI action to trigger this command is manufacturer specific.
Input ControlModeEff may be used as feedback information to synchronize ControlModeUser values of multiple LDSB in the same zone

DPT:	Name	DPT_LightControlMode	DPT ID	20.604	Datatype format	N_8

Field	Description	Sup.	Range	Unit	COV	Default
b	This field shall indicate whether automatic light control (0) or manual light control (1) is requested by the room occupant	M	- 0, 1 [1)] - 2 to 255: reserved	-	-	cs

Communication:

Binding Group:

Class	Type	Default
Geographical ☒	BuildingZone.Room.Subzone	cs (see parameter LightingGroup)
Application Specific ☐		
Unassigned ☐	Broadcast ☐ Configurable ☐	

DP Address:	IO Type(ID):	420 (LDSB)	Property ID:	64
LTE-Mode-Services (event): InfoReport ☒ (LTE-Mode Read-Response polling of the output shall always be supported)	COV ☒	MinRepTime: -- sec	Heartbeat: -- min	
	Output per default communicating ☒		Binding Group Wildcard allowed ☒	
	Tx Prio:	High ☐	Normal ☒	Low ☐
	Transm after Powerup: [2)] Stored Value ☒	Act Value ☐	Default Value ☒	
Property-Service (individual access):	Read only ☒	Read/Write ☐		

Exception Handling: Save at Powerdown ☐

--

Special Features:

1) It shall be possible that only one value of the range is transmitted, e.g. to trigger ‘automatic control’ only

2) It shall be possible that a default/stored value is transmitted spontaneously after power-return or that LDSB does not send an initial ControlModeUser message after power-return.

2.5.5 Output TimedStartStop

FB: LDSB	**LTE-Mode Server Output Name:** TimedStartStop	Mandatory ☐ Optional ☒

Description:

Output TimedStartStop triggers a timed switch on and autonomous switch off function by the actuator.

DPT:	Name	DPT_Start	DPT ID	1.010	Datatype format	B_1

Field	Description	Sup.	Range	Unit	COV	Default
b	b = 1 triggers the start of the timed switch on and autonomous switch off function b = 0: switch off immediately and stop the timer	M	{0, 1} [1)]	-	-	cs

Communication:

Binding Group:

Class	Type	Default
Geographical ☒	BuildingZone.Room.Subzone	cs (see parameter LightingGroup)
Application Specific ☐		
Unassigned ☐	Broadcast ☐ Configurable ☐	

DP Address:	IO Type(ID): 420 (LDSB)	Property ID: 65
LTE-Mode-Services (event): InfoReport ☒ (LTE-Mode Read-Response polling of the output shall always be supported)	COV ☒ MinRepTime: -- sec	Heartbeat: -- min
	Output per default communicating ☒	Binding Group Wildcard allowed ☒
	Tx Prio: High ☐ Normal ☒ Low ☐	
	Transm after Powerup: Stored Value ☐ Act Value ☐ Default Value ☐	
Property-Service (individual access):	Read only ☒ Read/Write ☐	

Exception Handling:	Save at Powerdown ☐
--	

Special Features:

[1)] It shall be possible that only one value of the range is transmitted, e.g. to trigger 'start' only
No spontaneous transmission of a default value after power-return. Transmission shall be triggered by user interaction only

2.5.6 Input InfoOnOff

Same as for the LSSB, see 1.5.4

2.5.7 Input ControlModeEff

Same as for the LSSB, see 1.5.5

2.5.8 Input ActualDimmingValue

FB: LDSB	**LTE-Mode Client Input Name:** ActualDimmingValue	Mandatory ☐ Optional ☒

Description:

Input ActualDimmingValue is used to receive the actual dimming level of the dimming actuator in the same zone.
This information can be used solely for visualization purposes or for other purposes.

DPT:	Name	DPT_Scaling	DPT ID	5.001	Datatype format	U_8

Field	Description	Sup.	Unit	Default
ActualValue	Dimming level in %	M	%	cs

Communication:

Binding Group:

Class	Type	Default
Geographical ☒	BuildingZone.Room.Subzone	cs (see parameter LightingGroup)
Application Specific ☐		
Unassigned ☐	Broadcast ☐ Configurable ☐	

DP Address:	IO Type(ID): 418 (LDAB)	Property ID: 52
LTE-Mode-Service (event): InfoReport ☒	InfoReport Sniffer on Binding Group: --	
	Timeout: -- Min	
LTE-Mode-Service (polling): Read – Response ☐	Read Wildcard / Resp Sniffer on Binding Group: --	

Value after Powerup:	Default Value ☒	Stored Value ☐
Exception Handling:		Save at Powerdown ☐

--

Special Features:

If multiple dimming actuators are operated in the same zone, each actuator may send its own ActualDimmingValue message. Since dimming speed and dimming curve of different actuators may not be identical, subsequent ActualDimmingValue feedback messages from different actuators would usually not be identical => last wins principle on the LDSB input
Therefore it is highly recommended to configure one actuator in the LightingGroup as ActualDimmingValue Group Speaker

2.5.9 Parameter-set LightingGroup

LightingGroup is implemented using the LTE-Mode Geographical zone concept. It consists of 3 properties belonging together.

2.5.9.1 Parameter BuildingZone

FB: LDSB	**Property Name (Server):**	LightingGroup.BuildingZone	Mandatory ☒ Optional ☐

Description:

Part of LightingGroup parameter set mapped to LTE-Mode Geographical zone:
-> BuildingEntity (Floor, Apartment, Building section etc.)

DPT:	Name	DPT_UcountValue8_Z	DPT ID	202.002	Datatype format	U_8Z_8

Field	Description	Sup.	Range	Unit	Default
CounterValue	Number of the BuildingZone	M	1 to 126	--	cs
Status - OutOfService - all other flags	 zone active /inactive not supported, fixed to '0'	 O NA	 true/false	bitset	 cs
Command - NormalWrite - SetOSV & ResetOSV - all other commands	 set zone inactive / active not supported	 M O NA		enum	

Communication:

DP Address:	IO Type(ID):	420 (LDSB)	Property ID:	101
(in the server)	Start-Index:	1	N° of elements	1
Property access:	Read only ☐		Read/Write ☒	
Protection	Read level	--	Write level	--

Exception Handling: Value after Powerup: Stored Value ☒ Act Value ☐ Default Value ☐

--

Special Features:

LDSB LTE-Mode runtime interface is deactivated if zone is 'OutOfService'. If parameter BuildingZone is 'OutOfService' also the corresponding Room and Subzone parameters are 'OutOfService' (common flag)

2.5.9.2 Parameter Room

FB: LDSB	**Property Name (Server):** LightingGroup.Room	Mandatory ☒ Optional ☐

Description:

Part of LightingGroup parameter set mapped to LTE-Mode Geographical zone:
-> Room within BuildingZone

DPT:	Name	DPT_UcountValue8_Z	DPT ID	202.002	Datatype format	U_8Z_8

Field	Description	Sup.	Range	Unit	Default
CounterValue	Room number	M	1 to 63	--	cs
Status - OutOfService - all other flags	 zone active /inactive not supported, fixed to '0'	 O NA	 true/false	bitset	cs
Command - NormalWrite - SetOSV & ResetOSV - all other commands	 set zone inactive / active not supported	 M O NA		enum	

Communication:

DP Address:	IO Type(ID):	420 (LDSB)	Property ID:	102
(in the server)	Start-Index:	1	N° of elements	1
Property access:	Read only ☐		Read/Write ☒	
Protection	Read level	--	Write level	--

Exception Handling: Value after Powerup: Stored Value ☒ Act Value ☐ Default Value ☐

--

Special Features:

LDSB LTE-Mode runtime interface is deactivated if zone is 'OutOfService'. If parameter BuildingZone is 'OutOfService' also the corresponding Room and Subzone parameters are 'OutOfService' (common flag)

2.5.9.3 Parameter Subzone

FB: LDSB	**Property Name (Server):** LightingGroup.Subzone	Mandatory ☒ Optional ☐

Description:

Part of LightingGroup parameter set mapped to LTE-Mode Geographical zone:
-> Subzone within BuildingZone.Room

DPT:	Name	DPT_UcountValue8_Z	DPT ID	202.002	Datatype format	U_8Z_8

Field	Description	Sup.	Range	Unit	Default
CounterValue	Subzone number	M	1 to 15	--	cs
Status - OutOfService - all other flags	 zone active /inactive not supported, fixed to '0'	 O NA	 true/false	bitset	cs
Command - NormalWrite - SetOSV & ResetOSV - all other commands	 set zone inactive / active not supported	 M O NA		enum	

Communication:

DP Address:	IO Type(ID):	420 (LDSB)	Property ID:	103
(in the server)	Start-Index:	1	N° of elements	1
Property access:	Read only ☐		Read/Write ☒	
Protection	Read level	--	Write level	--

Exception Handling: Value after Powerup: Stored Value ☒ Act Value ☐ Default Value ☐

--

Special Features:

LDSB LTE-Mode runtime interface is deactivated if zone is 'OutOfService'. If parameter BuildingZone is 'OutOfService' also the corresponding Room and Subzone parameters are 'OutOfService' (common flag)

2.5.10 Parameter LDSBMode

FB: LDSB	Property Name (Server): LDSBMode	Mandatory ☐ Optional ☒

Description:

This parameter selects the basic behavior of the LDSB in regards to the push-button interface used for light switching and relative dimming. This parameter is meaningful if conventional push-buttons/switches are connected to the light dimming sensor.
Four modes are supported:

- 1 push-button: to cover complete light switching (inverted SwitchOnOff, toggle mode) and dimming function
- 1 push-button: functionality is limited to send SwitchOnOff=On and to DimUp
- 1 push-button: functionality is limited to send SwitchOnOff=Off and to DimDown
- 2 push-button: one button used to switch on and dim up the light; the other button used to switch off and dim down the light

This parameter does not cover extended LDSB functionality for absolute dimming. If the optional output AbsSetvalueControl is implemented, this would be configured through manufacturer specific means.

DPT:	Name	DPT_DimmPBModel	DPT ID	20.607	Datatype format	N_8

Field	Description	Sup.	Range	Unit	Default
	1: one push button/binary input, inverse of SwitchOnOff sent 2: one push button/binary input, On / DimUp message sent 3: one push button/binary input, Off / DimDown message sent 4: two push buttons/binary inputs mode		1 to 4	--	cs

Communication:

DP Address: (in the server)	IO Type(ID):	420 (LDSB)	Property ID:	120
	Start-Index:	1	N° of elements	1
Property access:	Read only ☐		Read/Write ☒	
Protection	Read level	--	Write level	--

Exception Handling: Value after Powerup: Stored Value ☒ Act Value ☐ Default Value ☐

--

Special Features:

--

2.5.11 Parameter PBInterfNormalState

FB: LDSB	Property Name (Server): PBInterfNormalState	Mandatory ☐ Optional ☒

Description:

Defines normally open/closed behaviour of the physical push button interface

DPT:	Name	DPT_OpenClose	DPT ID	1.009	Datatype format	B_1

Field	Description	Sup.	Range	Unit	Default
b	- 0: normally open - 1: normally closed		{0, 1}		cs

Communication:

DP Address: (in the server)	IO Type(ID):	420 (LDSB)	Property ID:	121
	Start-Index:	1	N° of elements	1
Property access:	Read only ☐		Read/Write ☒	
Protection	Read level	--	Write level	--

Exception Handling: Value after Powerup: Stored Value ☒ Act Value ☐ Default Value ☐

--

Special Features:

--

2.5.12 Parameter TimeLongKeypress

FB: LDSB	Property Name (Server):	TimeLongKeypress			Mandatory ☐ Optional ☒
Description:					
Time to detect long key press 0,3 s to 7 s to change LDSB from switching to dimming operation					
DPT: Name	DPT_TimePeriod100 msec	DPT ID	7.004	Datatype format	U_{16}

Field	Description	Sup.	Range	Unit	Default
	Time indication with 100 ms resolution		300 to 7000	ms	cs

Communication:				
DP Address: (in the server)	IO Type(ID):	420 (LDSB)	Property ID:	122
	Start-Index:	1	N° of elements	1
Property access:	Read only ☐		Read/Write ☒	
Protection	Read level	--	Write level	--
Exception Handling:	Value after Powerup:	Stored Value ☒	Act Value ☐	Default Value ☐
--				
Special Features:				
--				

2.5.13 Parameter AbsSetvalue

FB: LDSB	Property Name (Server):	AbsSetvalue			Mandatory ☐ Optional ☒
Description:					
This parameter defines the default value for the output AbsSetvalueControl					
DPT: Name	DPT_Scaling	DPT ID	5.001	Datatype format	U_8

Field	Description	Sup.	Range	Unit	Default
Value	Default dimming level to be transmitted via AbsSetvalueControl message		0 % to 100 %	%	cs

Communication:				
DP Address: (in the server)	IO Type(ID):	420 (LDSB)	Property ID:	123
	Start-Index:	1	N° of elements	1
Property access:	Read only ☐		Read/Write ☒	
Protection	Read level	--	Write level	--
Exception Handling:	Value after Powerup:	Stored Value ☒	Act Value ☐	Default Value ☐
--				
Special Features:				
--				

3 FB Indoor Brightness Sensor (IBS)

3.1 Aims and objectives

The definitions in this document for FB Indoor Brightness Sensor (IBS) are an add-on to the existing FB Specification in [01] to describe the LTE-Mode runtime interface and LTE-Mode specific parameters of FB IBS. The FB IBS shall measure the luminance at a certain location and communicate the sensor value (Lux) to the KNX system, e.g. to a Lighting Controller.

3.2 Functional specification

3.2.1 Overview

Measurement of the luminance may be based on a built-in or hard-wired brightness sensor.

FB IBS shall provide the measured illuminance value via RoomIllumination process output using LTE-Mode InfoReport Service.

The human eye is capable of seeing an extremely wide range of luminance values (<<0,1 Lux to 100 000 Lux). In the LTE-Mode model RoomIllumination is encoded as DPT_Value_Lux (DPT_ID: 9.004) to cover the full range of values.

Distribution of RoomIllumination is event driven according to a fixed rule or configurable COV criteria. Because of the logarithmic characteristics of the eye to sense luminance, it is recommended to implement an adaptive COV criterion over the entire range of Lux values.

Parameter **COVPercent** represents the rate of change of the measured illumination in percentage to calculate the actual COV in Lux.

EXAMPLE 1 with COVPercent = 5 %

- current RoomIllumination = 10 Lux →COV = 0,5 Lux
- current RoomIllumination = 100 Lux →COV = 5 Lux
- current RoomIllumination = 1 000 Lux →COV = 50 Lux

Parameter **COVLux** represents the minimum change of the measured illumination in Lux to send an update of RoomIllumination.

Both parameters COVLux and COVPercent may be combined to define the COV characteristics over the entire range of values, e.g. in order to avoid frequent updates of RoomIllumination at twilight because of noise of the sensor.

The following figure shows an example to implement the COV characteristics. Detailed mechanisms are however manufacturer specific.

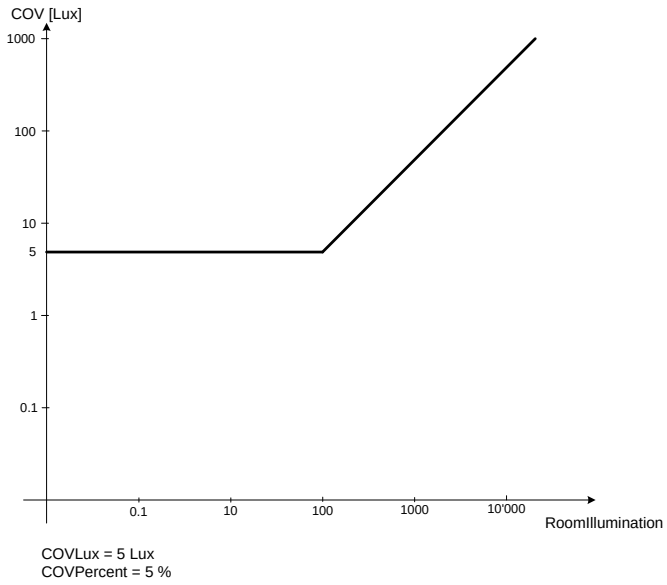

Figure 10 – Example of COV characteristics

If the measured brightness doesn't change more than the actual COV, then the current measured value shall be transmitted periodically with a fixed or configurable heartbeat repetition period (parameter **HeartbeatRepetitionTime**).

There shall be however a minimum wait time between updates of output signal RoomIllumination to avoid excessive bus load. The wait time is either fixed or configurable (parameter **MinRepetitionTime**).

Binding of FB IBS is based on LTE-Mode zoning concepts. Sensor information is provided according to LTE-Mode mechanisms in a LightingGroup.

In the LTE-Mode runtime system LightingGroup is mapped to existing LTE-Mode Geographical zones.

Runtime process communication of IBS is disabled if LTE-Mode LightingGroup is 'OutOfService'

3.3 Functional Block diagram

FB Indoor Brightness Sensor (IBS)	**409**
Inputs	**Outputs**
Binding Grp.: LightingGroup (Geographical)	
	IR: RoomIllumination
additional I/Os	**Parameters**
- Illuminance sensor	LightingGroup (Geographical)
	COVLux
	COVPercent
	HeartbeatRepetitionTime
	MinRepetitionTime

mandatory optional IR: LTE-Mode InfoReport

Figure 11 – Functional Block Diagram for FB Indoor Brightness Sensor

3.4 Datapoints

Datapoint	Description	Datapoint Type	IBS PID
Outputs			
RoomIllumination	RoomIllumination output represents the measured luminance	DPT_Value_Lux (9.004)	PID 51
Inputs			
--			
Parameters			
LightingGroup (3 Properties)	LTE-Mode Geographical Zone - Building zone like Floor, Apartment - Room within the Building zone - - Subzone within the Room	- DPT_UcountValue8_Z (202.002) - DPT_UcountValue8_Z (202.002) - DPT_UcountValue8_Z (202.002)	PID 101-103
COVLux	COV criterion in Lux to generate updates of output signal RoomIllumination	DPT_Value_Lux (9.004)	PID 110
HeartbeatRepetitionTime	Heartbeat repetition time in seconds	DPT_TimePeriodSec (7.005)	PID 111
COVPercent	Rate of change of the measured illumination in percentage to calculate the current COV in Lux	DPT_Percent_U8 (5.004)	PID 112
MinRepetitionTime	Minimum time between updates of output signal RoomIllumination	DPT_TimePeriodSec (7.005)	PID 113

Table 6 - LTE-Mode specific Properties

		Support
Parameter	LightingGroup	M

Table 7 - Standard Properties of Interface Object

		Support
Parameter	COVLux	O
	COVPercent	O
	HeartbeatRepetitionTime	O
	MinRepetitionTime	O
Diagnostic Data	--	

3.5 Detailed specification of the Datapoints

3.5.1 Output RoomIllumination

FB: IBS	**LTE-Mode Server Output Name:**	RoomIllumination	Mandatory ☒ Optional ☐

Description:

Output RoomIllumination shall represent the measured illumination value in Lux
If the calculated illumination changes more than indicated by a COV criterion, then the newly calculated value shall be transmitted spontaneously.
COV: see parameters COVLux and COVPercent
If the variation of measured illumination is within the COV limit, then the current measured value shall be transmitted periodically with a fixed or configurable heartbeat repetition period (parameter HeartbeatRepetitionTime).

DPT:	Name	DPT_Value_Lux	DPT ID	9.004	Datatype format	F_{16}

Field	Description	Sup.	Range	Unit	COV [1]	Default
Value	Measured value in Lux	M	Full range	Lux		-

Communication:

Binding Group:

Class	Type	Default
Geographical ☒	BuildingZone.Room.Subzone	cs (see parameter LightingGroup)
Application Specific ☐		
Unassigned ☐	Broadcast ☐ Configurable ☐	

DP Address:	IO Type(ID):	409 (IBS)	Property ID:	51
LTE-Mode-Services (event): InfoReport ☒ (LTE-Mode Read-Response polling of the output shall always be supported)	COV ☒ [1]	MinRepTime: [3]	sec Heartbeat: [2]	min
	Output per default communicating ☒		Binding Group Wildcard allowed ☐	
	Tx Prio:	High ☐	Normal ☒	Low ☐
	Transm after Powerup: Stored Value ☐		Act Value ☒	Default Value ☐
Property-Service (individual access):	Read only ☒		Read/Write ☐	

Exception Handling: Save at Powerdown ☐

--

Special Features:

[1] either fixed COV criterion or COV is derived from parameters COVLux and/or COVPercent
[2] Heartbeat may be fixed or configurable via parameter HeartbeatRepetitionTime
[3] MinRepTime is either fixed or configurable via parameter MinRepetitionTime

3.5.2 Parameter-set LightingGroup

LightingGroup is implemented using the LTE-Mode Geographical zone concept. It consists of 3 properties belonging together.

3.5.2.1 Parameter BuildingZone

FB: IBS	**Property Name (Server):** LightingGroup.BuildingZone	Mandatory ☒ Optional ☐

Description:

Part of LightingGroup parameter set mapped to LTE-Mode Geographical zone:
-> BuildingEntity (Floor, Apartment, Building section etc.)

DPT:	Name	DPT_UcountValue8_Z	DPT ID	202.002	Datatype format	U_8Z_8

Field	Description	Sup.	Range	Unit	Default
CounterValue	Number of the BuildingZone	M	1..126	--	cs
Status - OutOfService - all other flags	 zone active /inactive not supported, fixed to '0'	 O NA	 true/false	bitset	 cs
Command - NormalWrite - SetOSV & ResetOSV - all other commands	 set zone inactive / active not supported	 M O NA		enum	

Communication:

DP Address:	IO Type(ID):	409 (IBS)	Property ID:	101
(in the server)	Start-Index:	1	N° of elements	1
Property access:	Read only ☐		Read/Write ☒	
Protection	Read level	--	Write level	--

Exception Handling: Value after Powerup: Stored Value ☒ Act Value ☐ Default Value ☐

--

Special Features:

IBS LTE-Mode runtime interface is deactivated if zone is 'OutOfService'. If parameter BuildingZone is 'OutOfService' also the corresponding Room and Subzone parameters are 'OutOfService' (common flag)

3.5.2.2 Parameter Room

FB: IBS	**Property Name (Server):** LightingGroup.Room	Mandatory ☒ Optional ☐

Description:

Part of LightingGroup parameter set mapped to LTE-Mode Geographical zone:
-> Room within BuildingZone

DPT:	Name	DPT_UcountValue8_Z	DPT ID	202.002	Datatype format	U_8Z_8

Field	Description	Sup.	Range	Unit	Default
CounterValue	Room number	M	1 to 63	--	cs
Status - OutOfService - all other flags	 zone active /inactive not supported, fixed to '0'	 O NA	 true/false	bitset	 cs
Command - NormalWrite - SetOSV & ResetOSV - all other commands	 set zone inactive / active not supported	 M O NA		enum	

Communication:

DP Address:	IO Type(ID):	409 (IBS)	Property ID:	102
(in the server)	Start-Index:	1	N° of elements	1
Property access:	Read only ☐		Read/Write ☒	
Protection	Read level	--	Write level	--

Exception Handling: Value after Powerup: Stored Value ☒ Act Value ☐ Default Value ☐

--

Special Features:

IBS LTE-Mode runtime interface is deactivated if zone is 'OutOfService'. If parameter BuildingZone is 'OutOfService' also the corresponding Room and Subzone parameters are 'OutOfService' (common flag)

3.5.2.3 Parameter Subzone

FB: IBS	**Property Name (Server):** LightingGroup.Subzone	Mandatory ☒ Optional ☐

Description:

Part of LightingGroup parameter set mapped to LTE-Mode Geographical zone:
-> Subzone within BuildingZone.Room

DPT:	Name	DPT_UcountValue8_Z	DPT ID	202.002	Datatype format	U_8Z_8

Field	Description	Sup.	Range	Unit	Default
CounterValue	Subzone number	M	1 to 15	--	cs
Status - OutOfService - all other flags	 zone active /inactive not supported, fixed to '0'	 O NA	 true/false	bitset	cs
Command - NormalWrite - SetOSV & ResetOSV - all other commands	 set zone inactive / active not supported	 M O NA		enum	

Communication:

DP Address:	IO Type(ID):	409 (IBS)	Property ID:	103
(in the server)	Start-Index:	1	N° of elements	1
Property access:	Read only ☐		Read/Write ☒	
Protection	Read level	--	Write level	--

Exception Handling: Value after Powerup: Stored Value ☒ Act Value ☐ Default Value ☐

--

Special Features:

IBS LTE-Mode runtime interface is deactivated if zone is 'OutOfService'. If parameter BuildingZone is 'OutOfService' also the corresponding Room and Subzone parameters are 'OutOfService' (common flag)

3.5.3 Parameter COVLux

FB: IBS	**Property Name (Server):** COVLux	Mandatory ☐ Optional ☒

Description:

COVLux represents the minimum change of the measured illumination in Lux to send an update of RoomIllumination

DPT:	Name	DPT_Value_Lux	DPT ID	9.004	Datatype format	F_{16}

Field	Description	Sup.	Range	Unit	Default
FloatValue	This field shall contain the value over which the measured luminance shall change before it is transmitted on the bus.	M	cs	Lux	cs

Communication:

DP Address:	IO Type(ID):	409 (IBS)	Property ID:	110
(in the server)	Start-Index:	1	N° of elements	1
Property access:	Read only ☐		Read/Write ☒	
Protection	Read level	--	Write level	--

Exception Handling: Value after Powerup: Stored Value ☒ Act Value ☐ Default Value ☐

--

Special Features:

--

3.5.4 Parameter COVPercent

FB: IBS	**Property Name (Server):**	COVPercent	Mandatory ☐ Optional ☒

Description:

COVPercent defines the rate of change in percent of the current measured illumination to calculate the corresponding actual COV in Lux.
Example: COV Condition = 5 %; RoomIllumination = 700 Lux => actual COV = 35 Lux

DPT:	Name	DPT_Percent_U8	DPT ID	5.004	Datatype format	U_8

Field	Description	Sup.	Range	Unit	Default
Value	Rate of change	M	cs	%	cs

Communication:

DP Address:	IO Type(ID):	409 (IBS)	Property ID:	112
(in the server)	Start-Index:	1	N° of elements	1
Property access:	Read only ☐		Read/Write ☒	
Protection	Read level	--	Write level	--

Exception Handling: Value after Powerup: Stored Value ☒ Act Value ☐ Default Value ☐

--

Special Features:

--

3.5.5 Parameter HeartbeatRepetitionTime

FB: IBS	**Property Name (Server):**	HeartbeatRepetitionTime	Mandatory ☐ Optional ☒

Description:

Parameter HeartbeatRepetitionTime defines the heartbeat period for output RoomIllumination

DPT:	Name	DPT_TimePeriodSec	DPT ID	7.005	Datatype format	U_{16}

Field	Description	Sup.	Range	Unit	Default
TimePeriod	Heartbeat in s	M	cs	s	15 Min

Communication:

DP Address:	IO Type(ID):	409 (IBS)	Property ID:	111
(in the server)	Start-Index:	1	N° of elements	1
Property access:	Read only ☐		Read/Write ☒	
Protection	Read level	--	Write level	--

Exception Handling: Value after Powerup: Stored Value ☒ Act Value ☐ Default Value ☐

--

Special Features:

--

3.5.6 Parameter MinRepetitionTime

FB: IBS	**Property Name (Server):** MinRepetitionTime					Mandatory ☐ Optional ☒
Description:						
Parameter MinRepetitionTime defines the minimum wait time between two updates of output RoomIllumination						
DPT: Name	DPT_TimePeriodSec	DPT ID	7.005	Datatype format	U_{16}	
Field	Description	Sup.	Range	Unit	Default	
TimePeriod	Wait time in s	M	cs	s	10 s	
Communication:						
DP Address: (in the server)	IO Type(ID): 409 (IBS)	Property ID: 113				
	Start-Index: 1	N° of elements 1				
Property access:	Read only ☐	Read/Write ☒				
Protection	Read level --	Write level --				
Exception Handling:	Value after Powerup: Stored Value ☒ Act Value ☐ Default Value ☐					
--						
Special Features:						
--						

4 FB Indoor Luminance Sensor (ILS)

4.1 Aims and objectives

The definitions in this document for FB Indoor Luminance Sensor (ILS) are an add-on to the existing FB Specification in [01] to describe the LTE-Mode runtime interface and LTE-Mode specific parameters of FB ILS.

The FB ILS shall measure the luminance at a certain location and communicate the sensor value (cd/m²) to the KNX system, e.g. to a Lighting Controller.

4.2 Functional specification

4.2.1 Overview

Measured luminance represents the luminous intensity (cd/m^2) in a certain direction. Luminance characterizes the impression of brightness, which an illuminated or a luminous surface effects in the human eye. Luminance is independent from the distance to the observer; that means that the impression of brightness does not change when the distance between observer and observed object changes.

FB ILS shall provide the measured luminance value via IndoorLuminance process output using LTE-Mode InfoReport Service.

The dynamic range of luminance values is extremely wide. Typical luminance value that can be expected are in the range of 1 600 000 000 cd/m² (sun at noon) – 0,001 cd/m² (sky at night). In the LTE-Mode model IndoorLuminance is encoded as DPT_Value_Luminance (14.041) to cover the full range of values.

Distribution of IndoorLuminance is event driven according to a fixed rule or configurable COV criteria. Because of the logarithmic characteristics of the eye to sense luminance, it is recommended to implement an adaptive COV criterion over the entire range of cd/m² values.

Parameter **COVPercent** represents the rate of change of the measured luminance in percent to calculate the actual COV in cd/m².
Example with COVPercent = 10 %
- current IndoorLuminance = 10 000 000 cd/m² -> COV = 10 000 000 cd/m²
- current IndoorLuminance = 200 000 cd/m² -> COV = 20 000 cd/m²

Parameter **COV_cd_per_m2** represents the minimum change of the measured luminance in cd/m² to send an update of IndoorLuminance.

Both parameters COV_cd_per_m2 and COVPercent may be combined to define the COV characteristics over the entire range of values, e.g. in order to avoid frequent updates of IndoorLuminance at twilight because of noise of the sensor => same mechanisms as FB IBS.

If the measured luminance doesn't change more than the actual COV, then the current measured value shall be transmitted periodically with a fixed or configurable heartbeat repetition period (parameter **HeartbeatRepetitionTime**).

There shall be however a minimum wait time between updates of output signal IndoorLuminance to avoid excessive bus load. The wait time is either fixed or configurable (parameter **MinRepetitionTime**).

Binding of FB ILS is based on LTE-Mode zoning concepts. Sensor information is provided according to LTE-Mode mechanisms in a LightingGroup.

In the LTE-Mode runtime system LightingGroup is mapped to existing LTE-Mode Geographical zones.

Runtime process communication of ILS is disabled if LTE-Mode LightingGroup is 'OutOfService'

4.3 Functional Block diagram

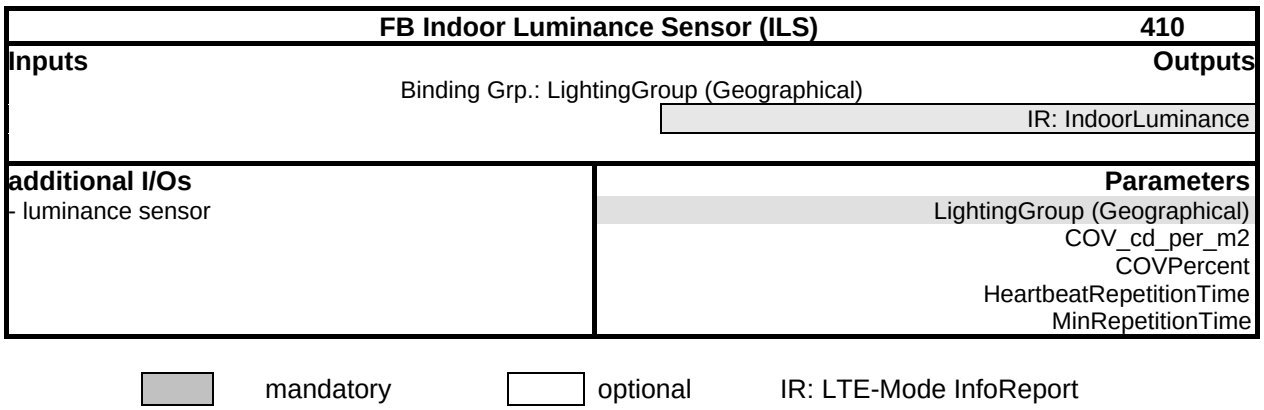

Figure 12 – Functional Block Diagram for FB Indoor Luminance Sensor

4.4 Datapoints

Datapoint	Description	Datapoint Type	ILS PID
Outputs			
IndoorLuminance	IndoorLuminance output represents the measured luminance	DPT_Value_Luminance (14.041)	PID 51
Inputs			
--			
Parameters			
LightingGroup (3 Properties)	LTE-Mode Geographical Zone - Building zone like Floor, Apartment - Room within the Building zone - Subzone within the Room	- DPT_UcountValue8_Z (202.002) - DPT_UcountValue8_Z (202.002) - DPT_UcountValue8_Z (202.002)	PID 101-103
COV_cd_per_m2	COV criterion in cd/m² to generate updates of output signal IndoorLuminance	DPT_Value_Luminance (14.041)	PID 110
HeartbeatRepetition-Time	Heartbeat repetition time in seconds	DPT_TimePeriodSec (7.005)	PID 111
COVPercent	Rate of change of the measured luminance in percentage to calculate the current COV in cd/m^2	DPT_Percent_U8 (5.004)	PID 112
MinRepetitionTime	Minimum time between updates of output signal RoomIllumination	DPT_TimePeriodSec (7.005)	PID 113

Table 8 - LTE-Mode specific Properties

		Support
Parameter	LightingGroup	M

Table 9 - Standard Properties of Interface Object

		Support
Parameter	COV_cd_per_m2	O
	COVPercent	O
	HeartbeatRepetitionTime	O
	MinRepetitionTime	O
Diagnostic Data	--	

4.5 Detailed specification of the Datapoints

4.5.1 Output IndoorLuminance

FB: ILS	**LTE-Mode Server Output Name:**	IndoorLuminance		Mandatory ☒ Optional ☐

Description:

Output IndoorLuminance shall represent the measured luminance value in cd/m².
If the calculated luminance changes more than indicated by a COV criterion, then the newly calculated value shall be transmitted spontaneously.
COV: see parameters COV_cd_per_m2 and COVPercent
If the variation of measured luminance is within the COV limit, then the current measured value shall be transmitted periodically with a fixed or configurable heartbeat repetition period (parameter HeartbeatRepetitionTime).

DPT:	Name	DPT_Value_Luminance	DPT ID	14.041	Datatype format	F_{32}

Field	Description	Sup.	Range	Unit	COV [1]	Default
Value	Measured luminance value	M	Full range	cd/m^2		-

Communication:

Binding Group:

Class	Type	Default
Geographical ☒	BuildingZone.Room.Subzone	cs (see parameter LightingGroup)
Application Specific ☐		
Unassigned ☐	Broadcast ☐ Configurable ☐	

DP Address:	IO Type(ID):	410 (ILS)	Property ID:	51
LTE-Mode-Services (event): InfoReport ☒ (LTE-Mode Read-Response polling of the output shall always be supported)	COV ☒ [1]	MinRepTime: [3] sec	Heartbeat: [2] min	
	Output per default communicating ☒		Binding Group Wildcard allowed ☐	
	Tx Prio: High ☐	Normal ☒	Low ☐	
	Transm after Powerup: Stored Value ☐	Act Value ☒	Default Value ☐	
Property-Service (individual access):	Read only ☒	Read/Write ☐		

Exception Handling: Save at Powerdown ☐

--

Special Features:

[1] either fixed COV criterion or COV is derived from parameters COV_cd_per_m2 and/or COVPercent
[2] Heartbeat may be fixed or configurable via parameter HeartbeatRepetitionTime
[3] MinRepTime is either fixed or configurable via parameter MinRepetitionTime

4.5.2 Parameter-set LightingGroup

LightingGroup is implemented using the LTE-Mode Geographical zone concept. It consists of 3 properties belonging together.

4.5.2.1 Parameter BuildingZone

FB: ILS	**Property Name (Server):**	LightingGroup.BuildingZone	Mandatory ☒ Optional ☐

Description:

Part of LightingGroup parameter set mapped to LTE-Mode Geographical zone:
-> BuildingEntity (Floor, Apartment, Building section etc.)

DPT:	Name	DPT_UcountValue8_Z	DPT ID	202.002	Datatype format	U_8Z_8

Field	Description	Sup.	Range	Unit	Default
CounterValue	Number of the BuildingZone	M	1 to 126	--	cs
Status - OutOfService - all other flags	 zone active /inactive not supported, fixed to '0'	 O NA	 true/false	bitset	 cs
Command - NormalWrite - SetOSV & ResetOSV - all other commands	 set zone inactive / active not supported	 M O NA		enum	

Communication:

DP Address:	IO Type(ID):	410 (ILS)	Property ID:	101
(in the server)	Start-Index:	1	N° of elements	1
Property access:	Read only ☐		Read/Write ☒	
Protection	Read level	--	Write level	--

Exception Handling: Value after Powerup: Stored Value ☒ Act Value ☐ Default Value ☐

--

Special Features:

ILS LTE-Mode runtime interface is deactivated if zone is 'OutOfService'. If parameter BuildingZone is 'OutOfService' also the corresponding Room and Subzone parameters are 'OutOfService' (common flag)

4.5.2.2 Parameter Room

FB: ILS	**Property Name (Server):**	LightingGroup.Room	Mandatory ☒ Optional ☐

Description:

Part of LightingGroup parameter set mapped to LTE-Mode Geographical zone:
-> Room within BuildingZone

DPT:	Name	DPT_UcountValue8_Z	DPT ID	202.002	Datatype format	U_8Z_8

Field	Description	Sup.	Range	Unit	Default
CounterValue	Room number	M	1 to 63	--	cs
Status - OutOfService - all other flags	 zone active /inactive not supported, fixed to '0'	 O NA	 true/false	bitset	 cs
Command - NormalWrite - SetOSV & ResetOSV - all other commands	 set zone inactive / active not supported	 M O NA		enum	

Communication:

DP Address:	IO Type(ID):	410 (ILS)	Property ID:	102
(in the server)	Start-Index:	1	N° of elements	1
Property access:	Read only ☐		Read/Write ☒	
Protection	Read level	--	Write level	--

Exception Handling: Value after Powerup: Stored Value ☒ Act Value ☐ Default Value ☐

--

Special Features:

ILS LTE-Mode runtime interface is deactivated if zone is 'OutOfService'. If parameter BuildingZone is 'OutOfService' also the corresponding Room and Subzone parameters are 'OutOfService' (common flag)

4.5.2.3 Parameter Subzone

FB: ILS	**Property Name (Server):**	LightingGroup.Subzone	Mandatory ☒ Optional ☐

Description:

Part of LightingGroup parameter set mapped to LTE-Mode Geographical zone:
-> Subzone within BuildingZone.Room

DPT:	Name	DPT_UcountValue8_Z	DPT ID	202.002	Datatype format	U_8Z_8

Field	Description	Sup.	Range	Unit	Default
CounterValue	Subzone number	M	1 to 15	--	cs
Status - OutOfService - all other flags	 zone active /inactive not supported, fixed to '0'	 O NA	 true/false	bitset	 cs
Command - NormalWrite - SetOSV & ResetOSV - all other commands	 set zone inactive / active not supported	 M O NA		enum	

Communication:

DP Address:	IO Type(ID):	410 (ILS)	Property ID:	103
(in the server)	Start-Index:	1	N° of elements	1
Property access:	Read only ☐		Read/Write ☒	
Protection	Read level	--	Write level	--

Exception Handling: Value after Powerup: Stored Value ☒ Act Value ☐ Default Value ☐

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Special Features:

ILS LTE-Mode runtime interface is deactivated if zone is 'OutOfService'. If parameter BuildingZone is 'OutOfService' also the corresponding Room and Subzone parameters are 'OutOfService' (common flag)

4.5.2.4 Parameter COV_cd_per_m2

FB: ILS	Property Name (Server):	COV_cd_per_m2	Mandatory ☐ Optional ☒

Description:

COV_cd_per_m2 represents the minimum change of the measured luminance in cd/m^2 to send an update of IndoorLuminance

DPT:	Name	DPT_Value_Luminance	DPT ID	14.041	Datatype format	F_{32}

Field	Description	Sup.	Range	Unit	Default
FloatValue	This field shall contain the value over which the measured luminance shall change before it is transmitted on the bus.	M	cs	cd/m^2	cs

Communication:

DP Address: (in the server)	IO Type(ID):	410 (ILS)	Property ID:	110
	Start-Index:	1	N° of elements	1
Property access:	Read only ☐		Read/Write ☒	
Protection	Read level	--	Write level	--

Exception Handling: Value after Powerup: Stored Value ☒ Act Value ☐ Default Value ☐

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Special Features:

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4.5.2.5 Parameter COVPercent

FB: ILS	Property Name (Server):	COVPercent	Mandatory ☐ Optional ☒

Description:

COVPercent defines the rate of change in percent of the current measured luminance to calculate the corresponding actual COV in cd/m^2.
Example: COV Condition = 5 %; IndoorLuminance = 10 000 cd/m^2 => actual COV = 500 cd/m^2

DPT:	Name	DPT_Percent_U8	DPT ID	5.004	Datatype format	U_8

Field	Description	Sup.	Range	Unit	Default
Value	Rate of change	M	cs	%	cs

Communication:

DP Address: (in the server)	IO Type(ID):	410 (ILS)	Property ID:	112
	Start-Index:	1	N° of elements	1
Property access:	Read only ☐		Read/Write ☒	
Protection	Read level	--	Write level	--

Exception Handling: Value after Powerup: Stored Value ☒ Act Value ☐ Default Value ☐

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Special Features:

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4.5.2.6 Parameter HeartbeatRepetitionTime

FB: ILS	**Property Name (Server):** HeartbeatRepetitionTime			Mandatory ☐ Optional ☒		
Description:						
Parameter HeartbeatRepetitionTime defines the heartbeat period for output IndoorLuminance						
DPT: Name: DPT_TimePeriodSec	DPT ID: 7.005		Datatype format: U_{16}			
Field	Description	Sup.	Range	Unit	Default	
TimePeriod	Heartbeat in s	M	cs	s	15 Min	
Communication:						
DP Address: (in the server)	IO Type(ID): 410 (ILS)	Property ID: 111				
	Start-Index: 1	N° of elements 1				
Property access:	Read only ☐	Read/Write ☒				
Protection	Read level --	Write level --				
Exception Handling:	Value after Powerup: Stored Value ☒ Act Value ☐ Default Value ☐					
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Special Features:						
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4.5.2.7 Parameter MinRepetitionTime

FB: ILS	**Property Name (Server):** MinRepetitionTime			Mandatory ☐ Optional ☒		
Description:						
Parameter MinRepetitionTime defines the minimum wait time between two updates of output IndoorLuminance						
DPT: Name: DPT_TimePeriodSec	DPT ID: 7.005		Datatype format: U_{16}			
Field	Description	Sup.	Range	Unit	Default	
TimePeriod	Wait time in s	M	cs	s	10 s	
Communication:						
DP Address: (in the server)	IO Type(ID): 410 (ILS)	Property ID: 113				
	Start-Index: 1	N° of elements 1				
Property access:	Read only ☐	Read/Write ☒				
Protection	Read level --	Write level --				
Exception Handling:	Value after Powerup: Stored Value ☒ Act Value ☐ Default Value ☐					
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Special Features:						
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