MAY 2020

ABB KNX Presence Detectors – Master/Slave Concept and other functions

Online Learning Session – Competence Center Europe – Smart Buildings

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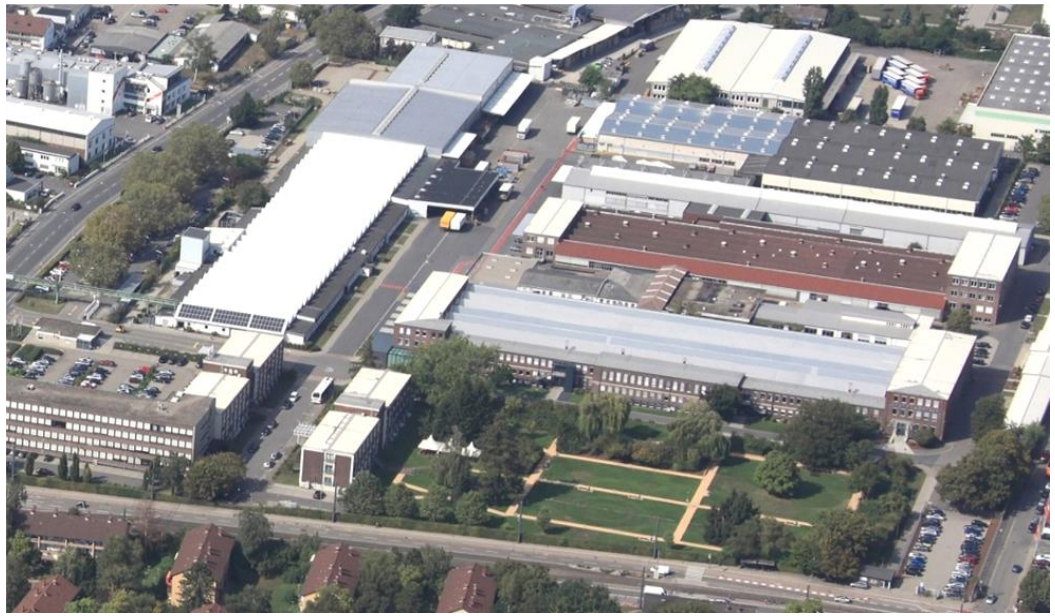

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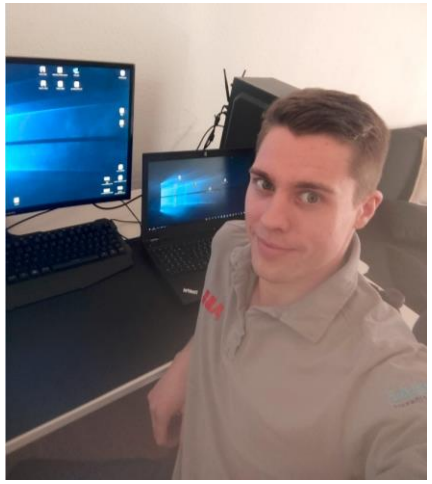

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Agenda

Introduction

Master/Slave Configuration

Two-stage switch-off

Operating modes

- Automatic with external push-buttons
- Automatic switch-on
- Automatic switch-off
- “Survey” / Monitoring

Temperature Control

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Introduction

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Introduction

ABB KNX Presence Detectors 6131/xx(-500)

- Flat line design with the best detection quality
- New applications for cost efficiency
- Native ETS4/5 application with firmware update via bus…
- Variations and options in functions, sizes, colors and installation heights
- KNX Presence Detectors designed to meet EN15232:2012
  - A list of control, automation, and technical management functions that affect the energy performance of buildings
  - A method for defining the minimum requirements for the control, automation, and technical building management functions implemented in different types of buildings
  - Detailed procedures for quantifying the impact these functions have on the energy performance of a building

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Introduction

For each demand

The Busch-Presence detector KNX, the Busch-Presence detector mini KNX and the Busch-Presence detector Corridor KNX are available in two versions: basic and premium with extended functionality. The variety in technical functions, sizes, colors and detection ranges offers a wide field of applications. Now there is an option for every need.

Function	Mini Basic	Mini Premium	Basic	Premium	Corridor Basic	Corridor Premium	Sky
	6131/20-xxx-500	6131/21-xxx-500	6131/30-xxx-500	6131/31-xxx-500	6131/50-xxx-500	6131/51-xxx-500	6131/40-xxx-500
General							
Type of installation	flush-mounted/surface-mounted						
Programming button accessible from out-side	X	X	X	X	X	X	X
Number of channels							
Movement detector	2	4 in total	2	4 in total	2	4 in total	2
Constant light switch	2		2		2		2
Combination	1 x each		1 x each		1 x each		1 x each
Constant light controller	–	2	–	2	–	2	–
Heating/cooling/ ventilation systems (HVAC)	–	1	–	1	–	1	–
Infrared receiver, can be operated via IR remote control 6010-25	–	10 button pairs + 4 single buttons/ 24 single buttons	–	10 button pairs + 4 single buttons/ 24 single buttons	–	10 button pairs + 4 single buttons/ 24 single buttons	(only red for activation of the programming mode)

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Introduction

General questions

How can I combine more than one presence detector to a Master/Slave configuration?

How can I use the two-stages switch-off function?

Which other operating modes are available?

How can I combine the presence detector with an external push-button?

How can I use the internal RTC?

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Master/Slave Configuration

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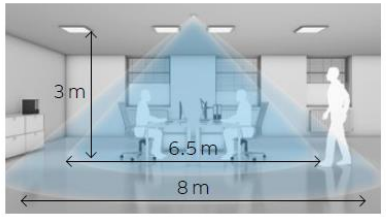
Master/Slave Configuration

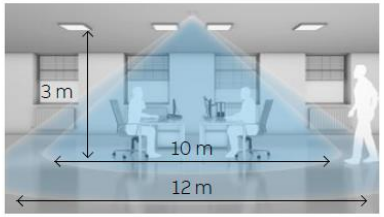
Detection range

- Each type of ABBs KNX presence detector has a different detection range
- The range depends also on the mounting height

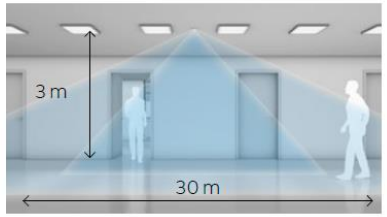
Mini



Premium



Corridor



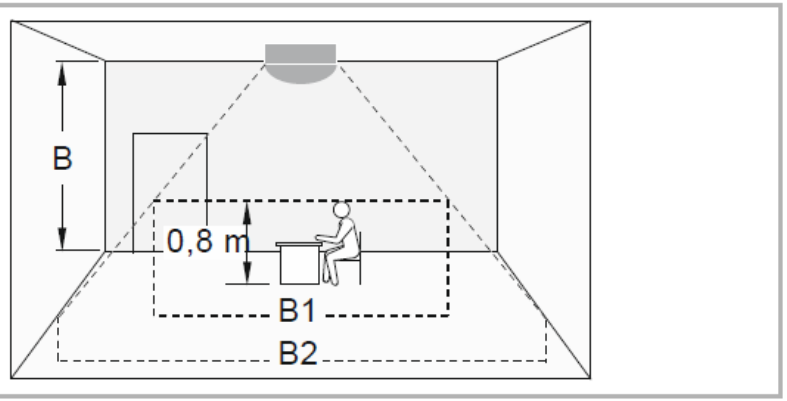


Fig. 14: Detection ranges of Busch-Presence detector KNX / Busch-Presence detector Premium KNX

[B] Mounting height

[B1] Wide inner detection range (seated person)

[B2] Wide outer detection range (walking person)

Mounting height (B)	Wide inner detection range (B1) (seated person)	Wide outer detection range
2.5 m	8 m max.	10 m max.
3 m	max. 10 m	12 m max.
4 m	14 m max.	16 m max.

Table 8: Detection ranges of Busch-Presence detector KNX / Busch-Presence detector Premium KNX

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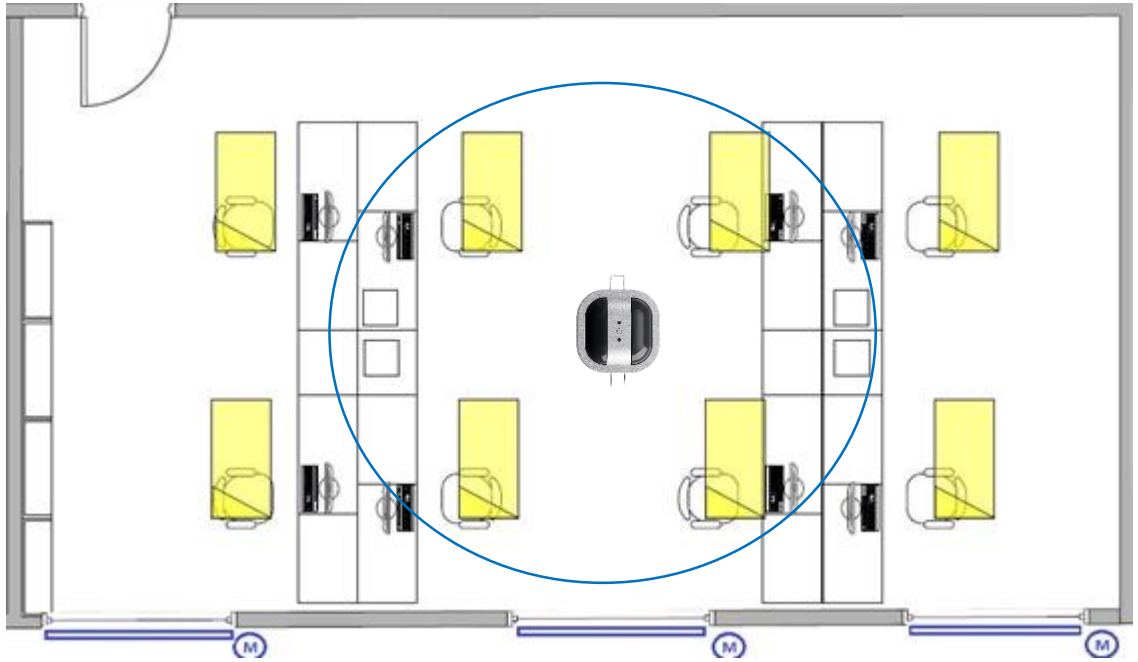
Master/Slave Configuration

Situation

For some applications (big offices, halls, schools) one presence detector is not able to cover the whole area of a room.



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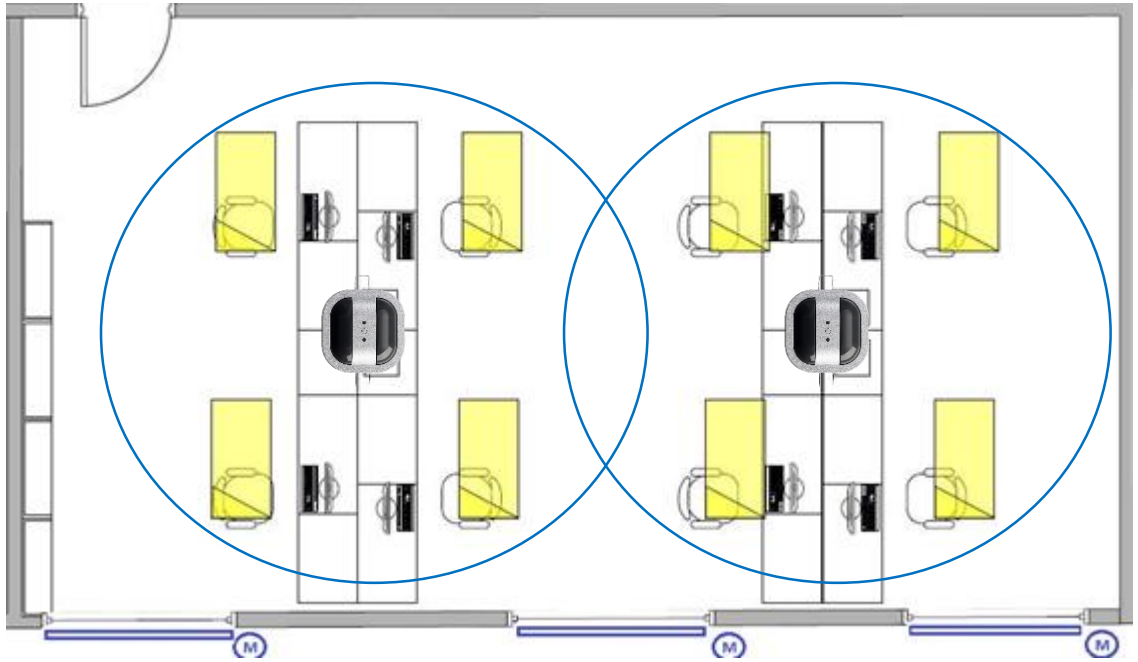
Master/Slave Configuration

Situation

For some applications (big offices, halls, schools) one presence detector is not able to cover the whole area of a room.

Therefore, a second presence detector can be used to cover the whole area and realize a central control for the light inside the room.



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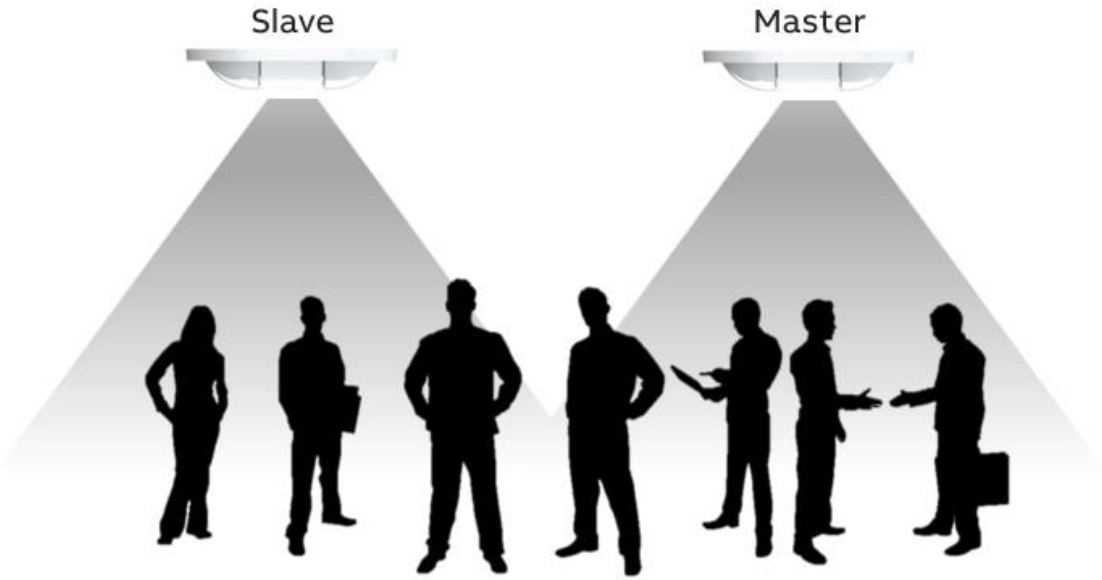
Master/Slave Configuration

Master/Slave

- Master: In master mode On and Off telegrams are sent (to an actuator) dependent on movement
- Slave: In slave mode On telegrams are sent cyclically (to the extension unit input of a master detector) when movement is detected



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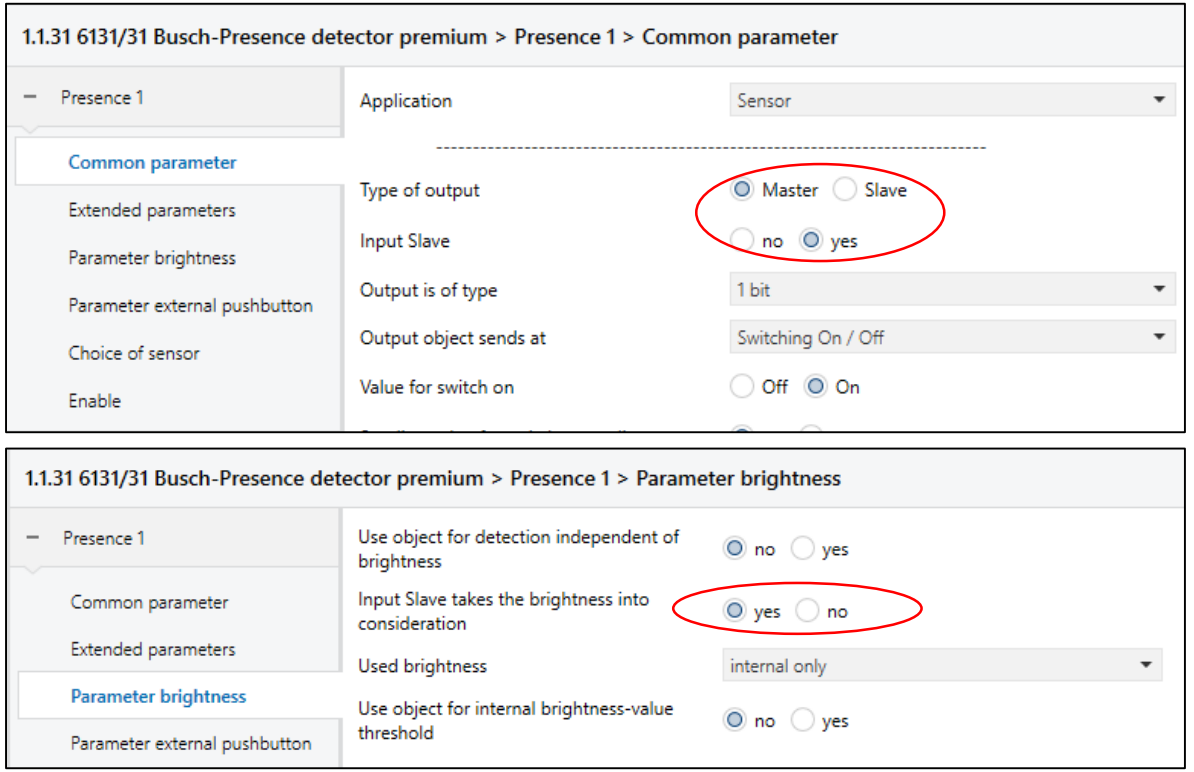
Master/Slave Configuration

Configuration Master

Important parameters:

- Type of output: Master
- Input Slave: yes
- Input Slave takes the brightness into consideration:
  - No: Every ON telegram to the input slave object ensures that the detector is switched on or the switch-off delay is reset. This is independent of whether the actual brightness is below or above the brightness-value threshold
  - Yes: The detector is switched on or the switch-off delay is reset only when the actual brightness is below the brightness-value threshold



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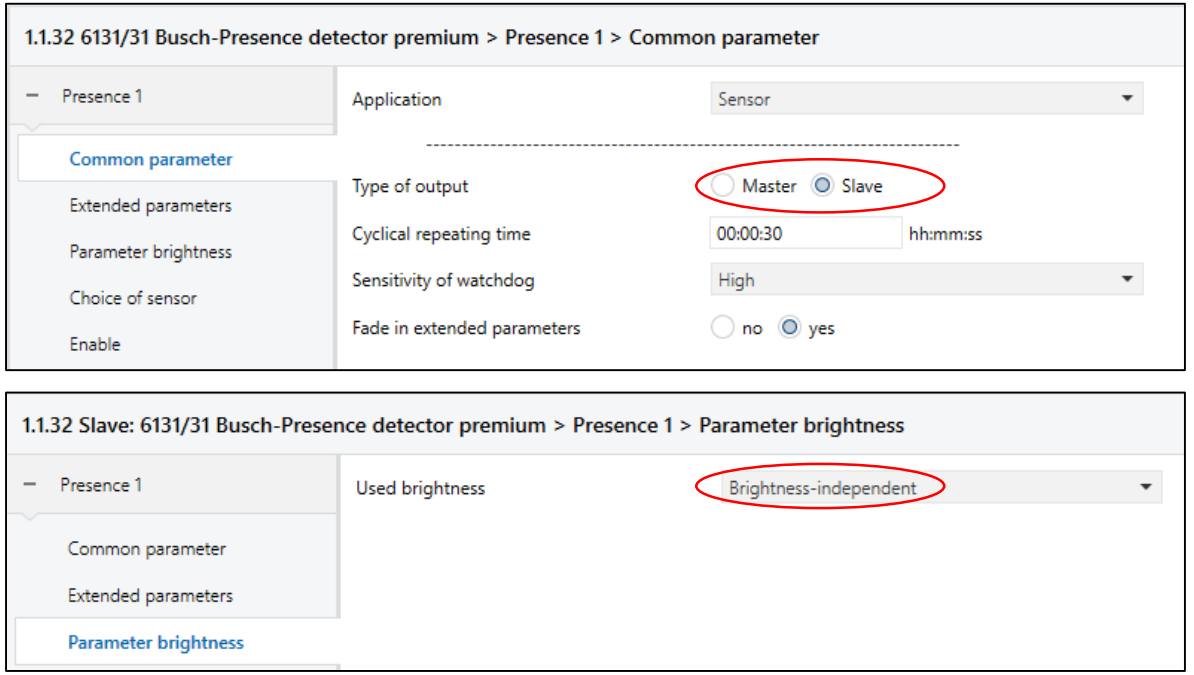
Master/Slave Configuration

Configuration Slave

Important parameters:

- Type of output: Slave
- Cyclical repeating time: 00:00:30
  - Slave is sending each 30 seconds a “1” to the master
  - With each “1” the light-on time of the master is reset
  - Hint: Light-on time should be longer than the cyclical repeating time
- Used brightness: Brightness-independent



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Master/Slave Configuration

Master/Slave – Group objects

	Number	Name	Object Function	Description	Group Addres	Length	C	R	W	T	U	Data Type	Priority
1.1.31 6131/31 Busch-Presence detector premium													
	69	BR: Brightness	Output	Brightness (Outp...	0/4/0	2 bytes	C	-	-	T	-	2-byte floa...	Low
	10	P1: Movement (master)	Output	SA: Output 1	0/1/0	1 bit	C	-	-	T	-	switch	Low
	3	P1: Slave	Input	Slave Input	0/1/11	1 bit	C	-	W	-	U	switch	Low
1.1.32 6131/31 Busch-Presence detector premium													
	69	BR: Brightness	Output			2 bytes	C	-	-	T	-	2-byte floa...	Low
	11	P1: Movement (slave)	Output	Slave Input	0/1/11	1 bit	C	-	W	T	-	switch	Low

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Master/Slave Configuration

Master/Slave – Bus monitor

Movement detected from slave

Slave is sending “1” every 10 sec.

Master is controlling the light and switches off when no more movement is detected

#	Time	Service	Flags	Prio	Source	Source Name	Destination	Destination Name	Rout	Type	DPT	Info
1	04.05.2020 19:15:13,299	Start										Recording was started,
2	04.05.2020 19:15:15,482	from bus	S=4	Low	1.1.32	Slave: 6131/31 Busch-Presence detecto...	0/1/11	Slave Input	6	GroupValueWrite		$01 | On
3	04.05.2020 19:15:21,850	from bus	S=6	Low	1.1.31	Master: 6131/31 Busch-Presence detect...	0/4/0	Brightness (Output)	6	GroupValueWrite		0C AB | 23,9
4	04.05.2020 19:15:25,501	from bus	S=0	Low	1.1.32	Slave: 6131/31 Busch-Presence detecto...	0/1/11	Slave Input	6	GroupValueWrite		$01 | On
5	04.05.2020 19:15:29,7...	from bus	S=2	Low	1.1.32	Slave: 6131/31 Busch-Presence detecto...	0/4/0	Brightness (Output)	6	GroupValueWrite		0C 7E | 23
6	04.05.2020 19:15:35,5...	from bus	S=4	Low	1.1.32	Slave: 6131/31 Busch-Presence detecto...	0/1/11	Slave Input	6	GroupValueWrite		$01 | On
7	04.05.2020 19:15:45,5...	from bus	S=6	Low	1.1.32	Slave: 6131/31 Busch-Presence detecto...	0/1/11	Slave Input	6	GroupValueWrite		$01 | On
8	04.05.2020 19:15:51,850	from bus	S=0	Low	1.1.31	Master: 6131/31 Busch-Presence detect...	0/4/0	Brightness (Output)	6	GroupValueWrite		0C 56 | 22,2
9	04.05.2020 19:15:55,5...	from bus	S=2	Low	1.1.32	Slave: 6131/31 Busch-Presence detecto...	0/1/11	Slave Input	6	GroupValueWrite		$01 | On
10	04.05.2020 19:15:59,7...	from bus	S=4	Low	1.1.32	Slave: 6131/31 Busch-Presence detecto...	0/4/0	Brightness (Output)	6	GroupValueWrite		0D B9 | 29,3
11	04.05.2020 19:16:14,845	from bus	S=6	Low	1.1.31	Master: 6131/31 Busch-Presence detect...	0/1/0	SA: Output 1	6	GroupValueWrite		$00 | Off
12	04.05.2020 19:16:14,896	from bus	S=0	Low	1.1.30	SA/S4.16.6.1 Switch Actuator,4-fold,16...	0/1/4	SA: Status 1	6	GroupValueWrite		$00 | Off

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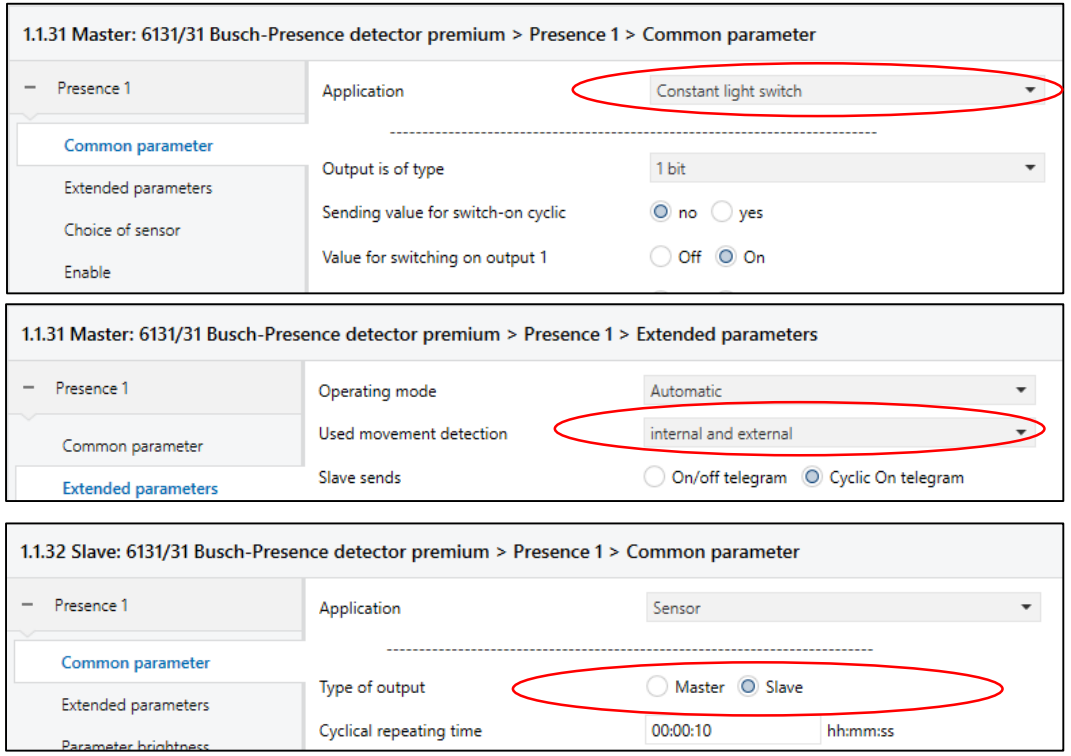
Master/Slave Configuration

Master/Slave and Constant Light

We can also use the Constant Light Switch/Controller application for a Master/Slave Configuration

- Application: Constant light switch / Constant light controller
- Used movement detection: internal and external



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Two-stage switch-off

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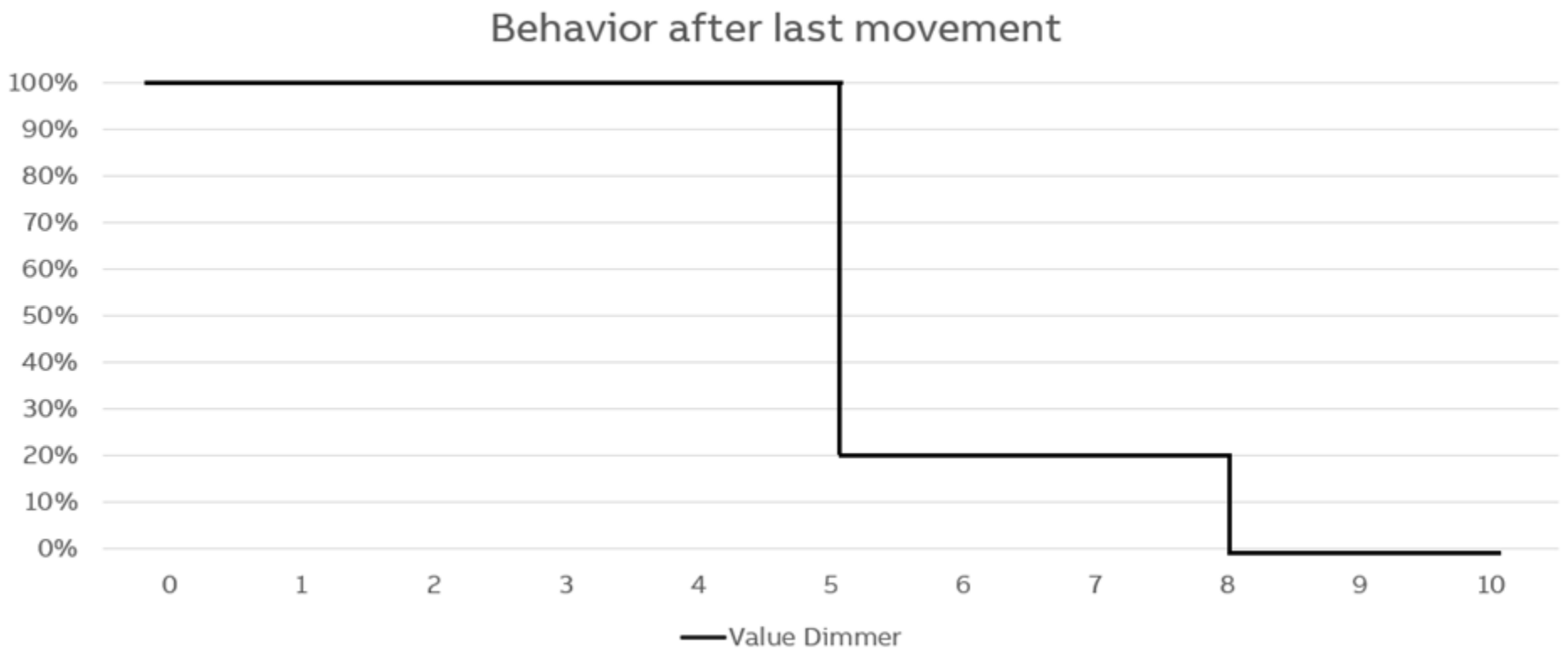
Two-stage switch-off

Two-stage switch-off

If movement is no longer detected, the light should be dimmed to 20% after 5 minutes and then to 0% after a further 3 minutes (switch-off).



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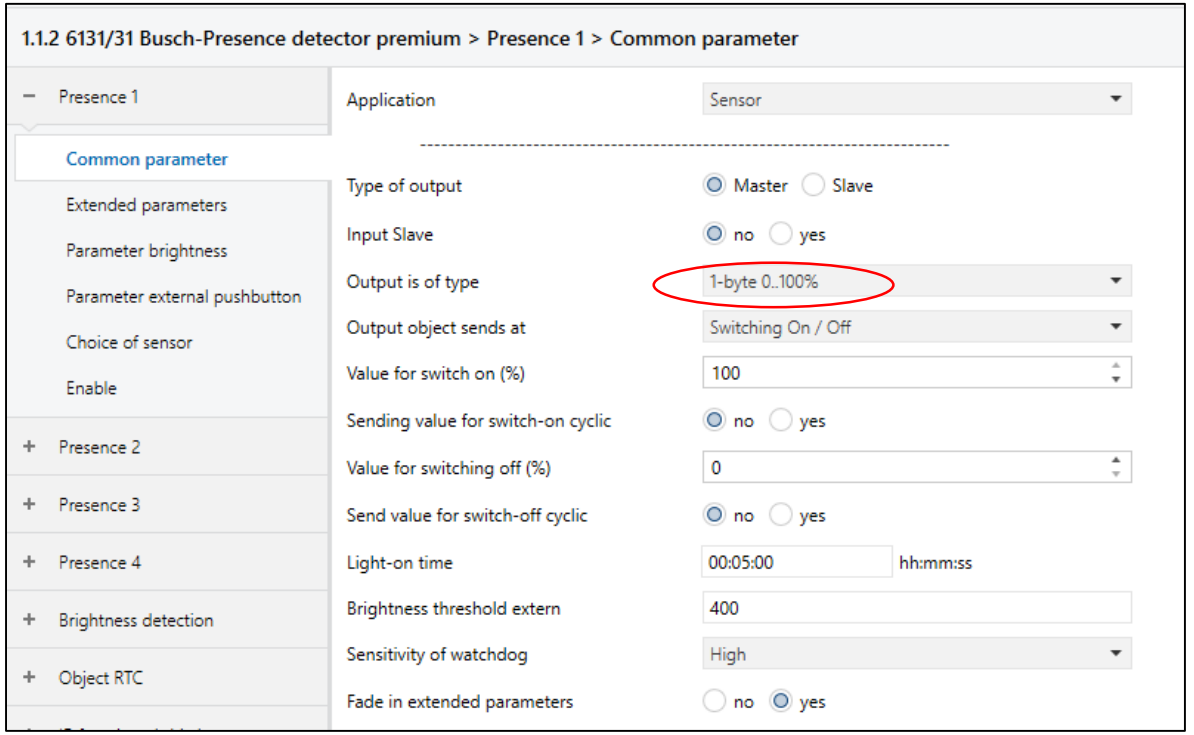
Two-stage switch-off

Two-stage switch-off

- This parameter is only displayed when "Output is of type" is set on 1 byte 0 - 100% or 1 byte 0 – 255 and for the application “Constant light controller”
- After the switch-off delay the detector first switches to the set reduced brightness and only then sends the value set under the "Value for switch-off" parameter after brightness reduced according to switch-off delay
- Example:
  - Switch-off delay = 5 minutes
  - Value for switch-off = 0%
  - Value for reduced brightness = 20%
  - Brightness reduced according to switch-off delay = 3 minutes



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Two-stage switch-off

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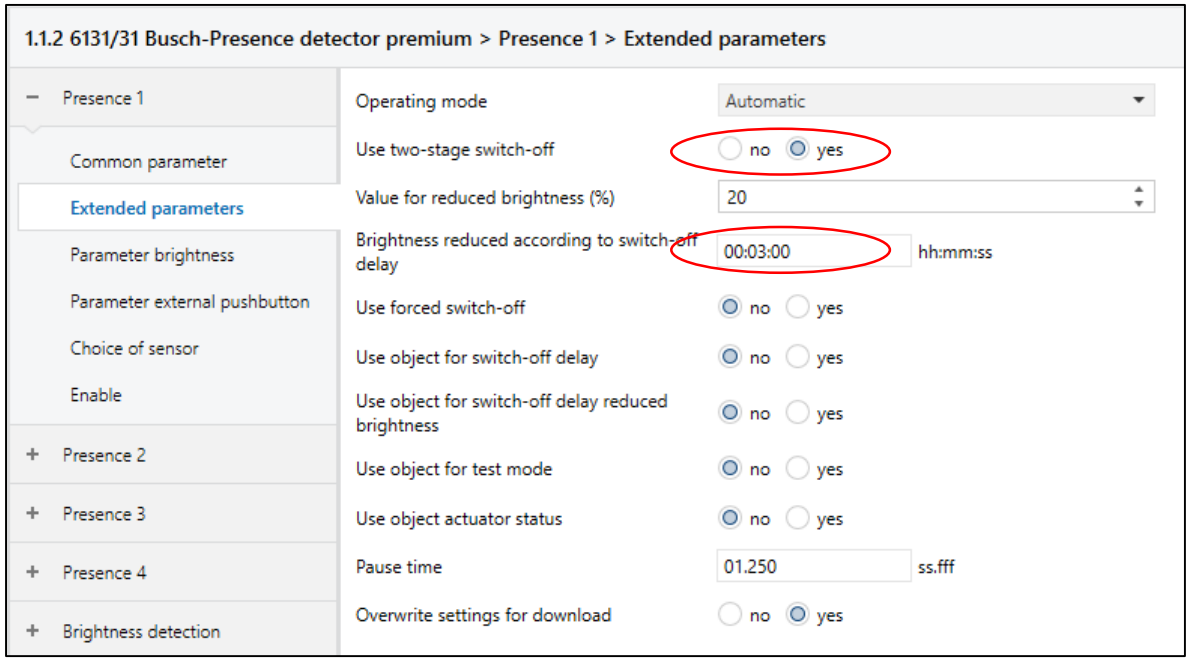

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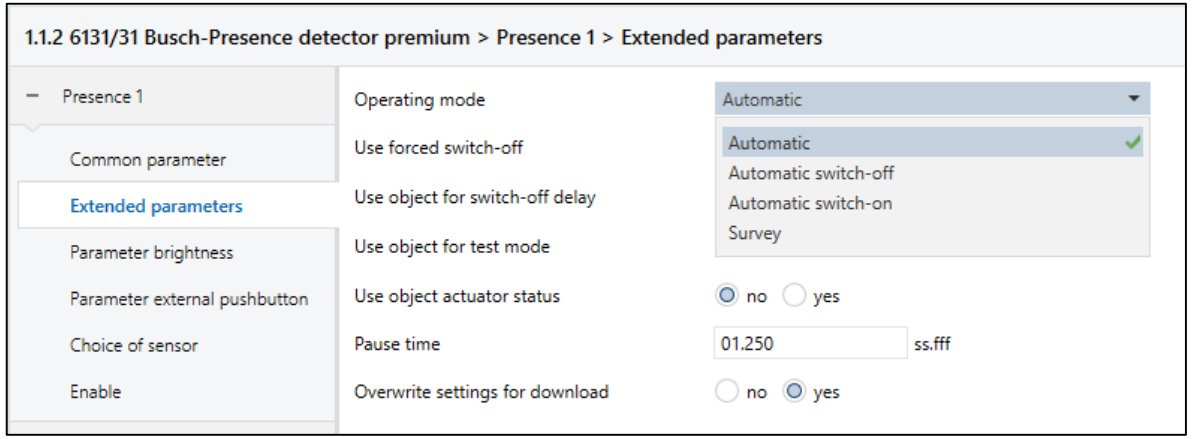
Operating modes

ABB KNX Presence Detectors – Master/Slave Concept and other functions

Operating modes

Operating modes: Sensor

- **Automatic:** the detector switches on automatically when detecting a movement. The switch-off is effected after the set switch-off delay beginning from the most recent detection.
- **Automatic switch-off:** the detector must be switched on manually using the "External push-button (input)" object. The switch-off is effected automatically under consideration of the switch-off delay.
- **Automatic switch-on:** the detector switches on automatically when detecting a movement. The switch-off is effected by the receipt of an Off telegram on the "External push-button (input)" object. Note: The detector switches off automatically after 6 hours.
- **“Survey” / Monitoring:** the detector switches on brightness-dependent if an adjustable component of movement has been recorded within the time period set. The switch-off occurs 2 seconds after switch-on and the last detection of movement.



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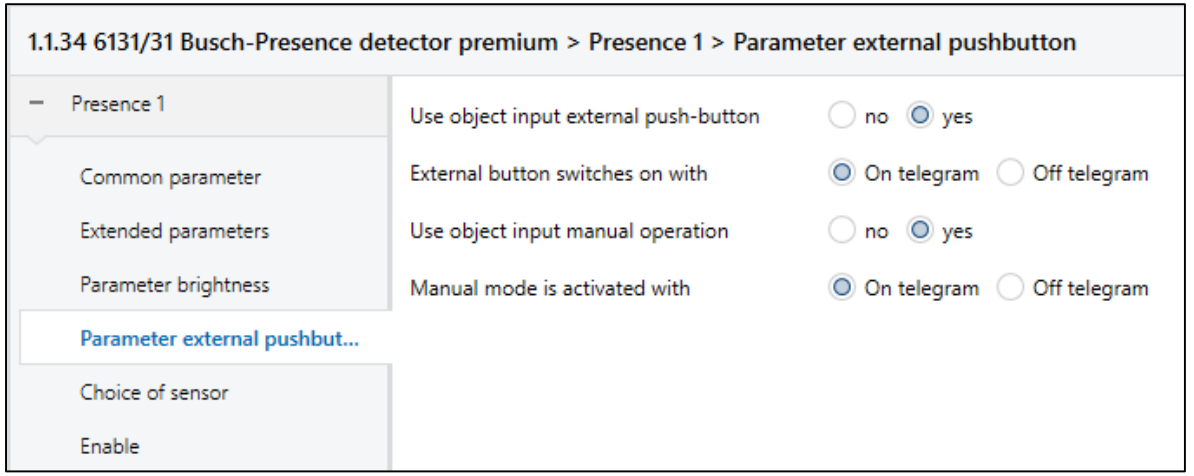
Operating modes

Automatic with external push-buttons

- In some applications we have to switch between automatic and manual mode
- External push-buttons can be used in combination with the presence detector
- Object “Switchover to manual operation”: if an ON telegram is received on this input, the detector is deactivated. In this case only manual operation is possible via the "External push-button" object
- The receipt of an Off telegram resets the detector to detector mode



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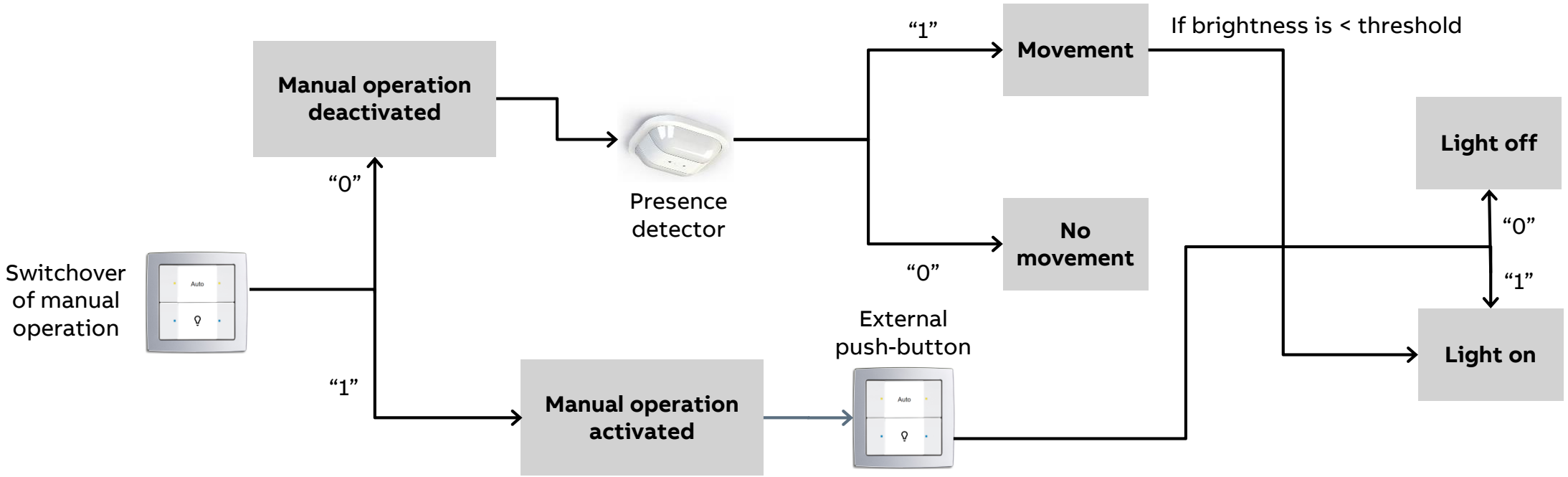
Operating modes

Automatic with external push-buttons



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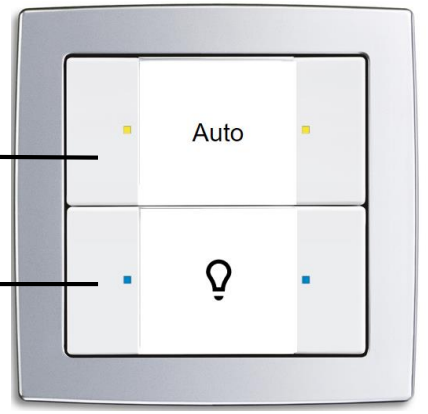
Operating modes

Automatic with external push-buttons

1	S1.1: Switching	Input / output	Automatic mode on/off	0/1/10	1 bit
11	LED1.1: LED status	Input	Automatic mode on/off	0/1/10	1 bit
16	LED1.2: LED status	Input	Automatic mode on/off	0/1/10	1 bit
21	S2.1: Switching	Input / output	External push-button	0/1/12	1 bit



10	P1: Movement (master)	Output	SA: Output 1	0/1/0	1 bit
12	P1: Switchover of manual operation	Input	Automatic mode on/off	0/1/10	1 bit
13	P1: External push-button	Input	External push-button	0/1/12	1 bit

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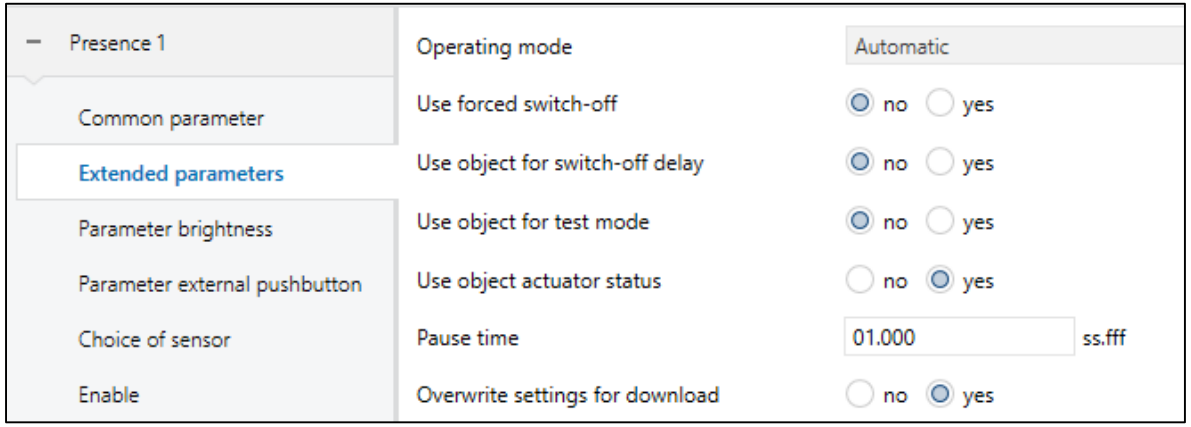
Operating modes

Actuator Status and pause time

- “actuator status”: This is connected with the status of a switch actuator, for example. When this actuator is switched off via a central command, the detector is informed and is ready again for switch-on after the pause time.
- The set pause time is started after the detector has been switched off due to expiry of the switch-off delay or when a switch-off telegram is received on objects “external push-button” or “actuator status”
- If movement is detected during this time, the detector is not switched on immediately. The pause time is first extended by 7 seconds. If there is still movement after these 7 seconds, the detector switches back on
- Example: The person switches the light off manually when leaving the room. Without the pause time the detected movement would cause a renewed switch-on during exiting



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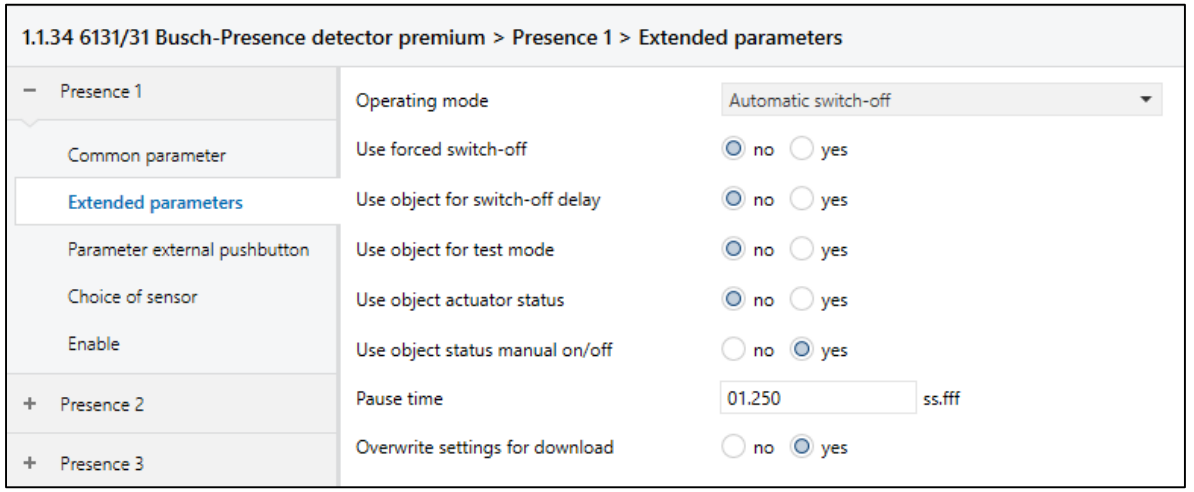
Operating modes

Automatic switch-off

Automatic switch-off:

- the detector must be switched on manually using the "External push-button (input)" object
- The switch-off is effected automatically under consideration of the switch-off delay
- Brightness independent
- Group object “P1: External push-button” will be activated automatically to switch on the light



Number	Name	Object Function	Description	Group Addres	Length	C	R	W	T	U	Data Type	Priority
69	BR: Brightness	Output	Brightness (Outp...	0/4/0	2 bytes	C	-	-	T	-	2-byte floa...	Low
13	P1: External push-button	Input	SA: Output 3	0/1/2	1 bit	C	-	W	-	U	switch	Low
10	P1: Movement (master)	Output	SA: Output 1	0/1/0	1 bit	C	-	-	T	-	switch	Low

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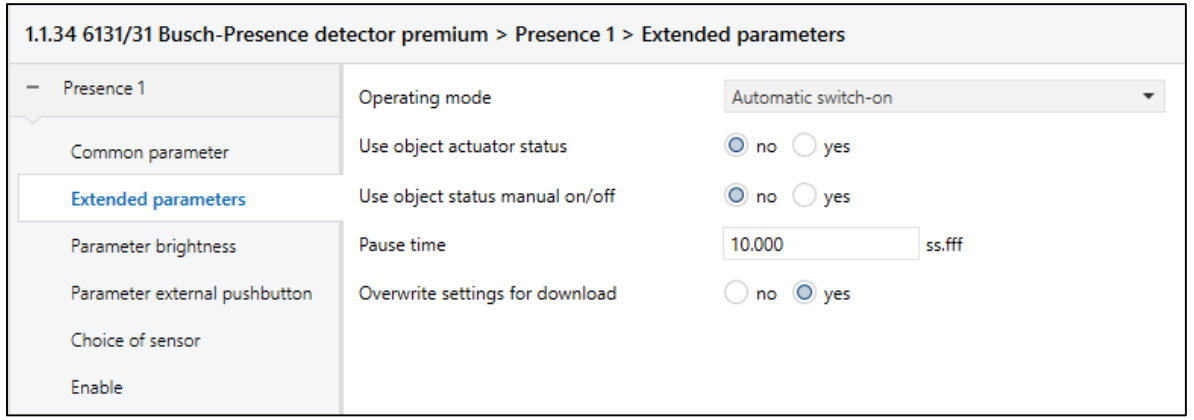
Operating modes

Automatic switch-on

Automatic switch-on:

- the detector switches on automatically when detecting a movement
- The switch-off is effected by the receipt of an Off telegram on the "External push-button (input)" object
- The detector switches off automatically after 6 hours
- Brightness depended
- Group object “P1: External push-button” will be activated automatically to switch off the light



Number	Name	Object Function	Description	Group Addres	Length	C	R	W	T	U	Data Type	Priority
69	BR: Brightness	Output	Brightness (Outp...	0/4/0	2 bytes	C	-	-	T	-	2-byte floa...	Low
13	P1: External push-button	Input	SA: Output 3	0/1/2	1 bit	C	-	W	-	U	switch	Low
10	P1: Movement (master)	Output	SA: Output 1	0/1/0	1 bit	C	-	-	T	-	switch	Low

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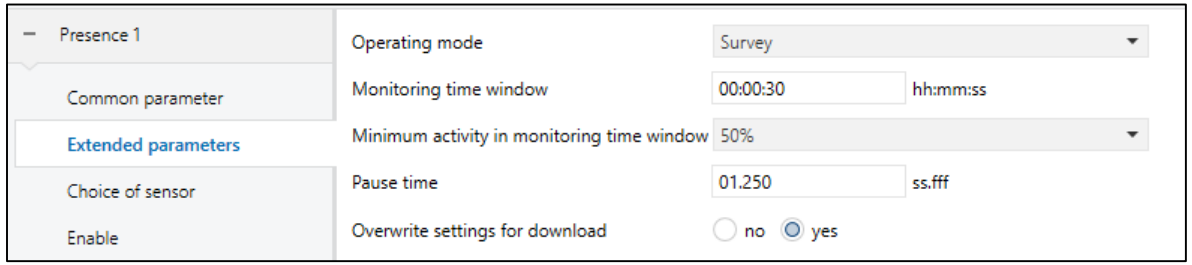
Operating modes

“Survey” / Monitoring

“Survey” / Monitoring:

- the detector switches on brightness-dependent if an adjustable component of movement has been recorded within the time period set
- The switch-off occurs 2 seconds after switch-on and the last detection of movement



Number	Name	Object Function	Description	Group Addres	Length	C	R	W	T	U	Data Type	Priority
69	BR: Brightness	Output	Brightness (Outp...	0/4/0	2 bytes	C	-	-	T	-	2-byte floa...	Low
15	P1: Survey	Output	SA: Output 1	0/1/0	1 bit	C	-	W	T	-	switch	Low

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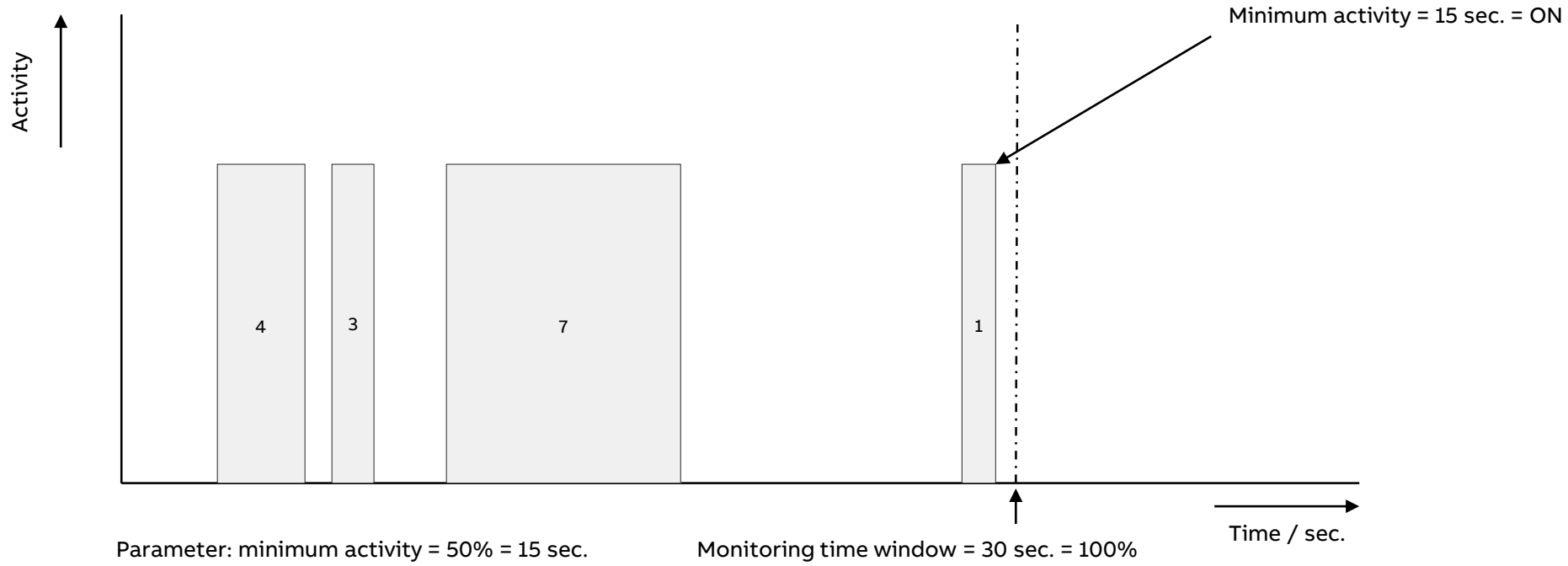
ABB KNX Presence Detectors – Master/Slave Concept and other functions

Operating modes

“Survey” / Monitoring



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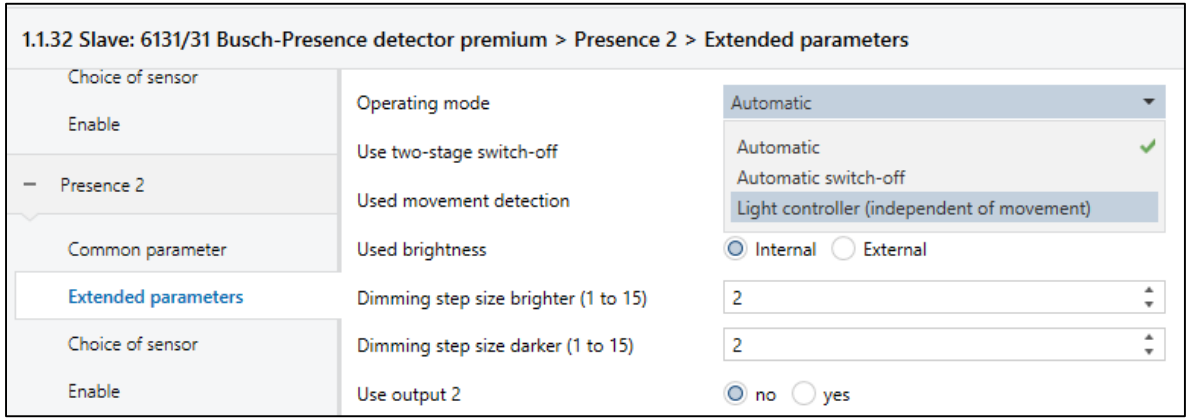
Operating modes

Operating modes: Constant Light Switch/Controller

- **Automatic:** the detector switches on automatically when detecting a movement. The switch-off is effected after the set switch-off delay beginning from the most recent detection
- **Automatic switch-off:** the presence detector must be switched on manually using the “automatic/manual” object. The switch-off is effected automatically under consideration
- **Light controller:** the presence detector switches on and off only on the basis of brightness ± hysteresis. Activation / deactivation through the “automatic/manual off” object



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Temperature control

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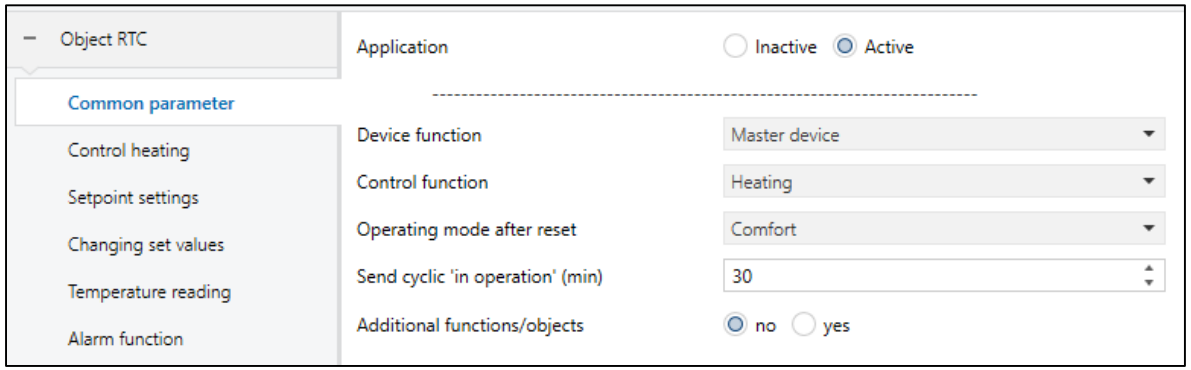
Other functions

Temperature control

– Integrated object room temperature controller



77	RTC: Heating control value	Output	RTC: Heating control va...	0/0/1	1 bit
81	RTC: Control On/Off (master)	Output	RTC: Control On/Off	0/0/2	1 bit
82	RTC: Actual temperature	Output	RTC: Actual temperature	0/0/3	2 bytes
85	RTC: Fault, actual temperature (mast...	Output	RTC: Fault, actual temp...	0/0/4	1 bit
87	RTC: actual setpoint	Output	RTC: actual setpoint	0/0/5	2 bytes
88	RTC: Operating mode (master)	Input/Output	RTC: Operating mode	0/0/6	1 byte
89	RTC: Superimposed operating mod...	Input	RTC: Superimposed op...	0/0/7	1 byte
113	RTC: On/off request (master)	Input	RTC: On/off request	0/0/8	1 bit
114	RTC: Setpoint display (master)	Output	RTC: Setpoint display	0/0/9	2 bytes
115	RTC: Request setpoint (master)	Input	RTC: Request setpoint	0/0/10	1 byte
116	RTC: Confirm setpoint (master)	Output	RTC: Confirm setpoint	0/0/11	1 byte
122	RTC: Controller status HVAC (master)	Output	RTC: Controller status H...	0/0/12	1 byte
123	RTC: Commissioned	Output	RTC: Commissioned	0/0/13	1 bit

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Other functions

Temperature control

– Activation via the application “Sensor”

28	P2: Movement (master)	Output	RTC: Operating mode	0/0/6	1 byte
88	RTC: Operating mode (master)	Input/Output	RTC: Operating mode	0/0/6	1 byte

1.1.31 Master: 6131/31 Busch-Presence detector premium > Presence 2 > Common parameter

- Presence 2
  - Common parameter
- Presence 3
- Presence 4
- Brightness detection
- Object RTC
- IR functions (white)

Application	Sensor
Type of output	Master / Slave
Input Slave	no / yes
Output is of type	RTC operating mode switchover (1 byte)
Output object sends at	Switching On / Off
Value for switch on	Comfort
Sending value for switch-on cyclic	no / yes
Value for switch off	ECO

1.1.31	Master: 6131/31 Busch-Presence detect...0/1/0	SA: Output 1	6	GroupValueWrite	$01 | On
1.1.31	Master: 6131/31 Busch-Presence detect...0/0/6	RTC: Operating mode	6	GroupValueWrite	$01 | 0 %
1.1.31	Master: 6131/31 Busch-Presence detect...0/0/12	RTC: Controller status HVAC	6	GroupValueWrite	$21 | 13 %
1.1.31	Master: 6131/31 Busch-Presence detect...0/0/5	RTC: actual setpoint	6	GroupValueWrite	0C 1A | 21
1.1.30	SA/S4.16.6.1 Switch Actuator,4-fold,16... 0/1/4	SA: Status 1	6	GroupValueWrite	$01 | On
1.1.31	Master: 6131/31 Busch-Presence detect...0/0/9	RTC: Setpoint display	6	GroupValueWrite	0C 1A | 21
1.1.31	Master: 6131/31 Busch-Presence detect...0/0/1	RTC: Heating control value	6	GroupValueWrite	$01 | On
1.1.31	Master: 6131/31 Busch-Presence detect...0/0/12	RTC: Controller status HVAC	6	GroupValueWrite	$21 | 13 %

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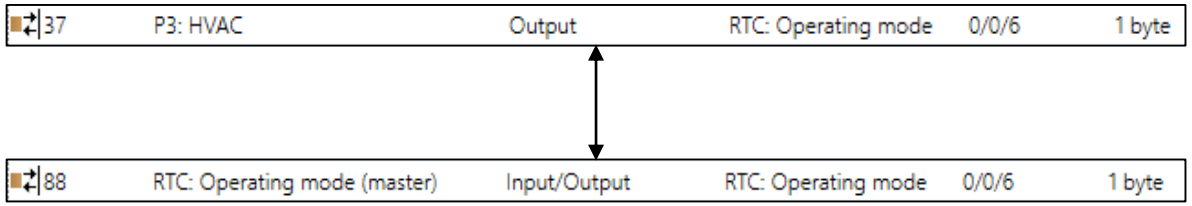
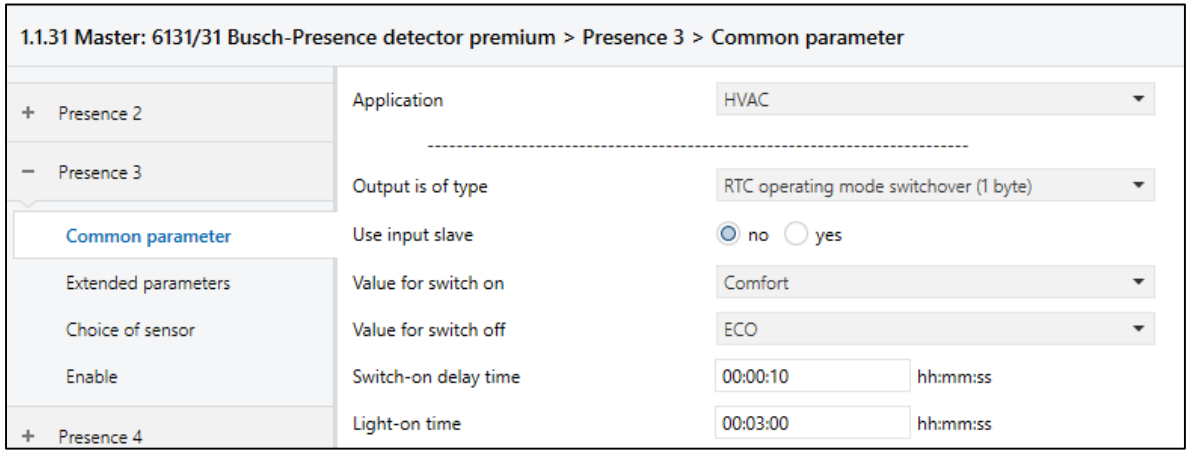
Other functions

Temperature control

– Activation via the application “HVAC” (With switch-on delay and brightness independent)





1.1.31	Master: 6131/31 Busch-Presence detect...0/0/6	RTC: Operating mode	6	GroupValueWrite	$01 | 0 %
1.1.31	Master: 6131/31 Busch-Presence detect...0/0/12	RTC: Controller status HVAC	6	GroupValueWrite	$21 | 13 %
1.1.31	Master: 6131/31 Busch-Presence detect...0/0/5	RTC: actual setpoint	6	GroupValueWrite	0C 1A | 21
1.1.31	Master: 6131/31 Busch-Presence detect...0/0/9	RTC: Setpoint display	6	GroupValueWrite	0C 1A | 21
1.1.31	Master: 6131/31 Busch-Presence detect...0/0/1	RTC: Heating control value	6	GroupValueWrite	$01 | On
1.1.31	Master: 6131/31 Busch-Presence detect...0/0/12	RTC: Controller status HVAC	6	GroupValueWrite	$21 | 13 %

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Questions

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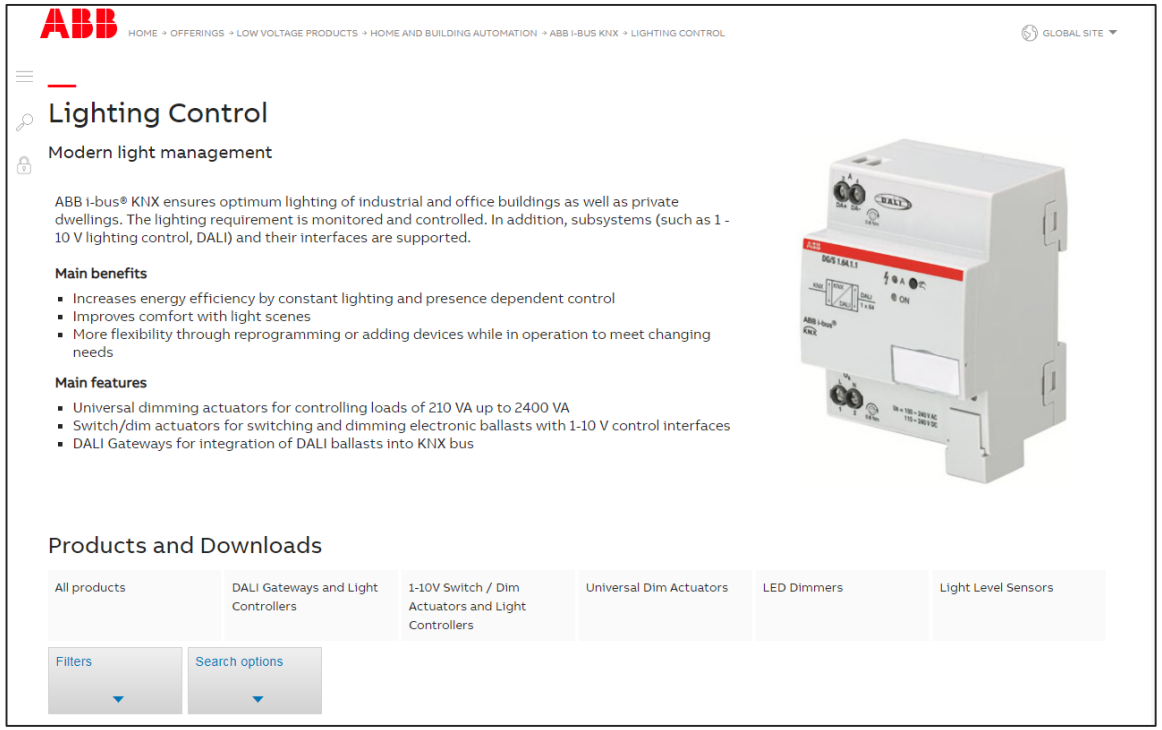
Online Learning Session

Homepage

www.abb.com/KNX

→ Products and Downloads
→ Lighting Control
→ Search Options DG/S

- Product Manual
- CAD Drawing
- Installation and Operating Instructions
- Specification Text
- ETS Application
- Selection Table
- CE & RoHS Declaration of Conformity
- • •



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Online Learning Session

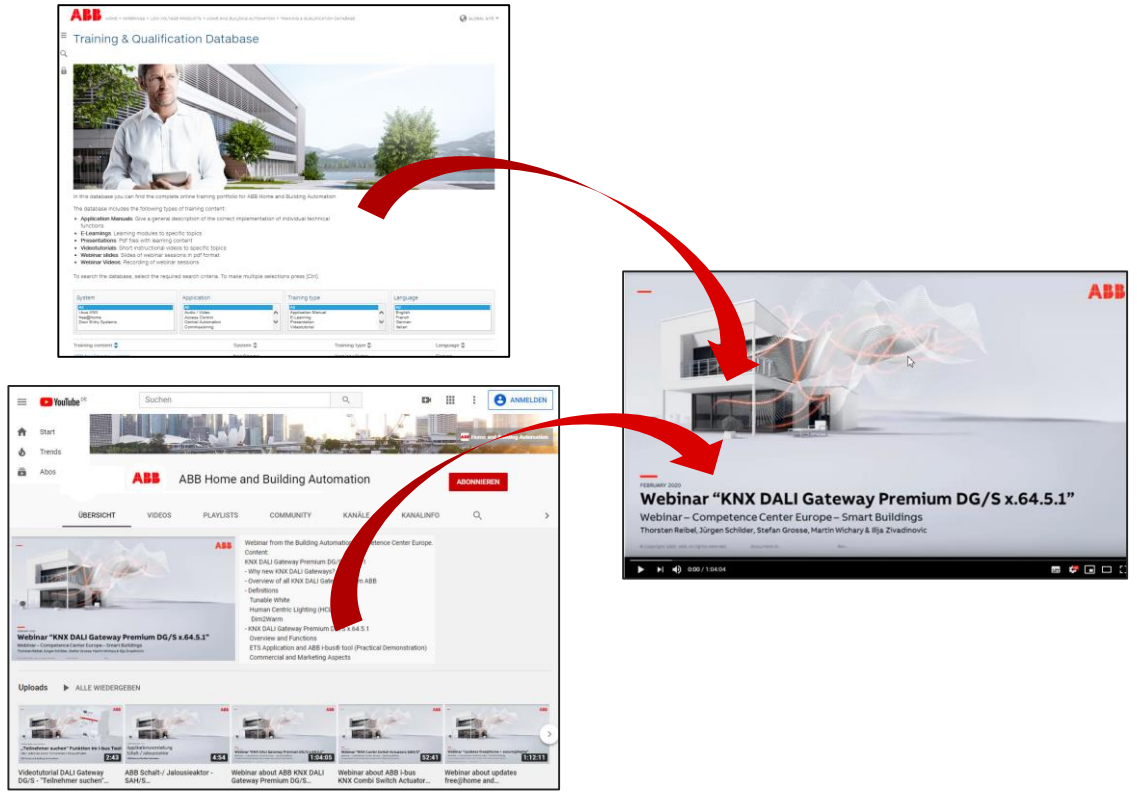
Further information

Training & Qualification Database

– The database includes the following types of training content:
  - Application Manuals
  - E-Learnings
  - Presentations
  - Video tutorials
  - Webinar slides and videos
  - ww.abb.com/knx or https://go.abb/ba-training

Youtube

– Channel “ABB Home and Building Automation”
  - https://www.youtube.com/user/ABBibusKNX



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Training & Qualification Calendar

In addition to the online modules and the traditional training programs offered by your local ABB sales team, we offer a variety of on-site trainings conducted by our specialists at different ABB training facilities

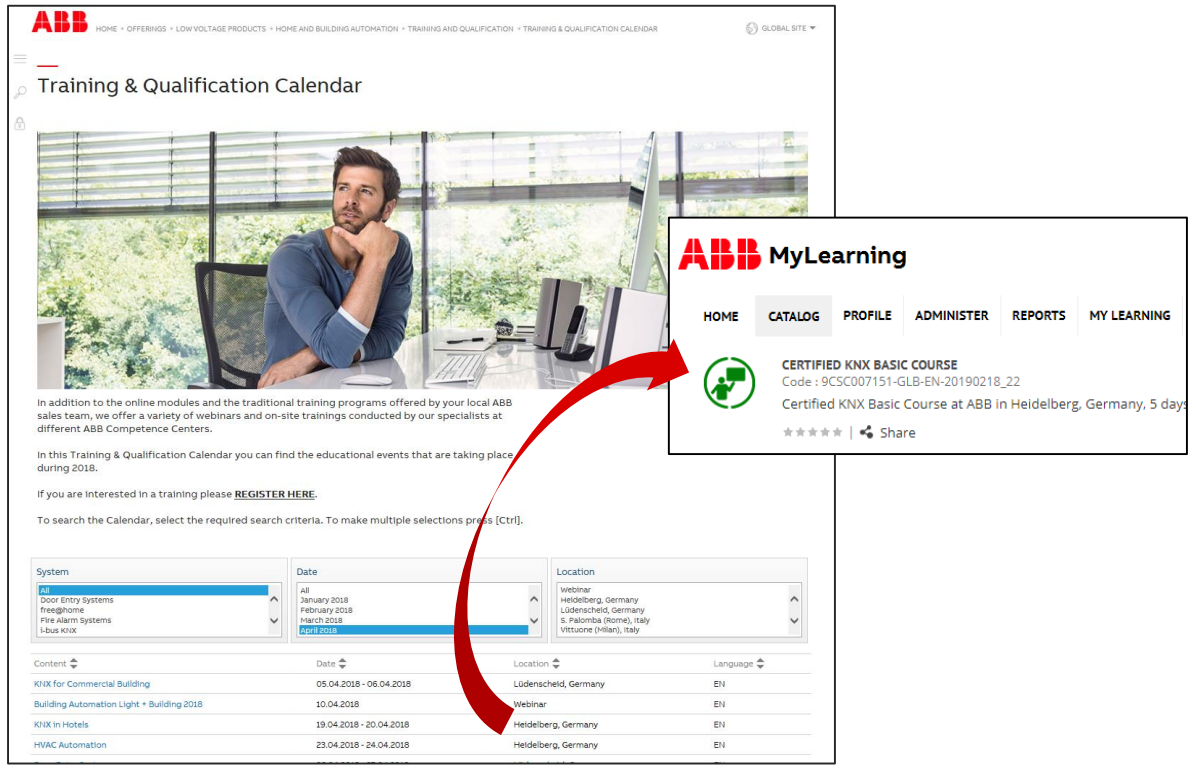
In this Training & Qualification Calendar you can find the educational events that are taking place during 2020

If you are interested in a training please click the training und you will be forwarded to register in “ABB MyLearning”

www.abb.com/knx or https://go.abb/ba-training

→ Training and Qualification

→ Training Calendar



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KNX Certified Trainings 2020

Certified KNX Courses in Heidelberg

- Advanced Course: 13th to 17th Jul.
- Tutor Course: 19th to 23rd Oct.
- Basic Course : 16th to 20th Nov.
- Followed by two day application training

Safe the date!!!

And many more training courses in the calendar
“International Training Dates 2020”

www.abb.com/knx or https://go.abb/ba-training

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Next Webinar

KNX DALI Gateway Premium DG/S x.64.5.1 – Special functions

- Human Centric Lighting (HCL) – Colour temperature curve following daylight
- Dim2Warm – Colour temperature changes proportionally to brightness with the effect like a light bulb
- Standby switch-off – Ballast voltage shutdown via additional switching actuator to save energy
- Scenes – 1 bit recall and 1 byte coded scenes
- ABB i-bus® tool – Search menu for a ballast with unknown address, operating hours, …

Wednesday 6th May 2020

- Morning 09:00 am Europe Time (Berlin, UTC + 2h)
- Afternoon 03:00 pm Europe Time (Berlin, UTC + 2h)

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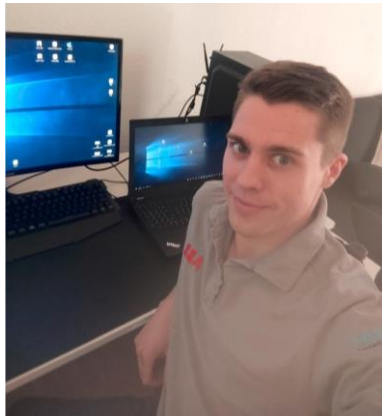
Next online learning sessions

- Tuesday 5th May: ETS: Presence Detector – Zones, Calibration and Constant Light Control
- Thursday 7th May: Presence Detector – Master/Slave Concept

… and more will follow

NEW !!!

From home office to home office



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