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

Online Learning Session – Competence Center Europe – Smart Buildings

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Online Learning Session – Competence Center Europe - Smart Buildings

NEW !!!
From home office to home office

ABB STOTZ-KONTAKT GmbH
Heidelberg / Germany
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
ABB KNX Presence Detectors – Master/Slave Concept and other functions

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.

<table>
<thead>
<tr>
<th>Function</th>
<th>Mini Basic</th>
<th>Mini Premium</th>
<th>Basic</th>
<th>Premium</th>
<th>Corridor Basic</th>
<th>Corridor Premium</th>
<th>Sky</th>
</tr>
</thead>
<tbody>
<tr>
<td>Movement detector</td>
<td>2</td>
<td>4 in total</td>
<td>2</td>
<td>4 in total</td>
<td>2</td>
<td>4 in total</td>
<td>2</td>
</tr>
<tr>
<td>Constant light switch</td>
<td>2</td>
<td>2</td>
<td>2</td>
<td>2</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Combination</td>
<td>1 x each</td>
<td>1 x each</td>
<td>1 x each</td>
<td>1 x each</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Constant light controller</td>
<td>–</td>
<td>2</td>
<td>–</td>
<td>2</td>
<td>–</td>
<td>–</td>
<td>–</td>
</tr>
<tr>
<td>Heating/cooling/ ventilation systems (HVAC)</td>
<td>–</td>
<td>1</td>
<td>–</td>
<td>1</td>
<td>–</td>
<td>–</td>
<td>1</td>
</tr>
<tr>
<td>Infrared receiver, can be operated via IR remote control</td>
<td>–</td>
<td>10 button pairs + 4 single buttons/24 single buttons</td>
<td>–</td>
<td>10 button pairs + 4 single buttons/24 single buttons</td>
<td>–</td>
<td>10 button pairs + 4 single buttons/24 single buttons</td>
<td>(only red for activation of the programming mode)</td>
</tr>
</tbody>
</table>

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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
Detection range

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

<table>
<thead>
<tr>
<th>Mounting height (B)</th>
<th>Wide inner detection range [B1] (seated person)</th>
<th>Wide outer detection range</th>
</tr>
</thead>
<tbody>
<tr>
<td>2.5 m</td>
<td>8 m max.</td>
<td>10 m max.</td>
</tr>
<tr>
<td>3 m</td>
<td>max. 10 m</td>
<td>12 m max.</td>
</tr>
<tr>
<td>4 m</td>
<td>14 m max.</td>
<td>16 m max.</td>
</tr>
</tbody>
</table>
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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
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.
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

<table>
<thead>
<tr>
<th>Number</th>
<th>Name *</th>
<th>Object Function</th>
<th>Description</th>
<th>Group Address</th>
<th>Length</th>
<th>C</th>
<th>R</th>
<th>W</th>
<th>T</th>
<th>U</th>
<th>Data Type</th>
<th>Priority</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.1.31</td>
<td>0131/31 Busch-Presence detector premium</td>
<td>#2</td>
<td>BR: Brightness</td>
<td>Output</td>
<td>Brightness (Outp... 0/4/0)</td>
<td>2 bytes</td>
<td>C</td>
<td>-</td>
<td>T</td>
<td>-</td>
<td>2-byte float</td>
<td>Low</td>
</tr>
<tr>
<td>1.1.32</td>
<td>0131/31 Busch-Presence detector premium</td>
<td>#2</td>
<td>BR: Brightness</td>
<td>Output</td>
<td></td>
<td>2 bytes</td>
<td>C</td>
<td>-</td>
<td>T</td>
<td>-</td>
<td>2-byte float</td>
<td>Low</td>
</tr>
<tr>
<td>1.1.33</td>
<td>0131/31 Busch-Presence detector premium</td>
<td>#2</td>
<td>PL: Movement (master)</td>
<td>Output</td>
<td>SA: Output 1</td>
<td>0/1/0</td>
<td>1 bit</td>
<td>C</td>
<td>-</td>
<td>T</td>
<td>-</td>
<td>switch</td>
</tr>
<tr>
<td>1.1.34</td>
<td>0131/31 Busch-Presence detector premium</td>
<td>#2</td>
<td>PL: Slave</td>
<td>Input</td>
<td>Slave Input</td>
<td>0/1/0</td>
<td>1 bit</td>
<td>C</td>
<td>-</td>
<td>W</td>
<td>-</td>
<td>U</td>
</tr>
</tbody>
</table>
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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
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
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

- 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
**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
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.
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
Operating modes

**Automatic with external push-buttons**

- Manual operation deactivated
- Presence detector:
  - No movement
  - Movement
  - If brightness is < threshold
- Manual operation activated
  - External push-button
  - Light on
  - Light off
Operating modes

Automatic with external push-buttons

<table>
<thead>
<tr>
<th>#</th>
<th>Description</th>
<th>Type</th>
<th>Automatic mode on/off</th>
<th>Value</th>
<th>Bit</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>S1: Switching</td>
<td>Input / output</td>
<td>Automatic mode on/off</td>
<td>0/1/10</td>
<td>1 bit</td>
</tr>
<tr>
<td>11</td>
<td>LED1: LED status</td>
<td>Input</td>
<td>Automatic mode on/off</td>
<td>0/1/10</td>
<td>1 bit</td>
</tr>
<tr>
<td>16</td>
<td>LED1.2: LED status</td>
<td>Input</td>
<td>Automatic mode on/off</td>
<td>0/1/10</td>
<td>1 bit</td>
</tr>
<tr>
<td>21</td>
<td>S2: Switching</td>
<td>Input / output</td>
<td>External push-button</td>
<td>0/1/12</td>
<td>1 bit</td>
</tr>
</tbody>
</table>

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### 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.

---

### Operating modes

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Operating mode</th>
<th>Automatic</th>
</tr>
</thead>
<tbody>
<tr>
<td>- Presence 1</td>
<td>Use forced switch-off</td>
<td>no</td>
</tr>
<tr>
<td>- Common parameter</td>
<td>Use object for switch-off delay</td>
<td>no</td>
</tr>
<tr>
<td>- Extended parameters</td>
<td>Use object for test mode</td>
<td>no</td>
</tr>
<tr>
<td>- Parameter brightness</td>
<td>Use object actuator status</td>
<td>no</td>
</tr>
<tr>
<td>- Parameter external pushbutton</td>
<td>Pause time</td>
<td>01.000</td>
</tr>
<tr>
<td>- Choice of sensor</td>
<td>Overwrite settings for download</td>
<td>no</td>
</tr>
</tbody>
</table>
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
### 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.
“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

“Survey” / Monitoring

Parameter: minimum activity = 50% = 15 sec.

Monitoring time window = 30 sec. = 100%

Minimum activity = 15 sec. = ON
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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

![Temperature control diagram]
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Other functions

Temperature control

– Activation via the application “Sensor”
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Other functions

Temperature control

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

![Diagram of KNX Presence Detectors with temperature control and other functions]
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
– • • •
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
  - www.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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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, and 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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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

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

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