Thorsten Reibel/Jürgen Schilder – ABB Customer Training Center Heidelberg – September 2014

ABB STOTZ-KONTAKT GmbH
ABB i-bus® KNX
Webinar “ Constant Light Control ”

Webinar “Constant Light Control with KNX”

Webinar “Constant Light Control with KNX”
Why ?

- Essential arguments for the application constant light control with dimmable components are
  - Energy saving
  - Such reduction of operating costs
  - Optimised working conditions with constant brightness
  - Added lighting comfort
  - Increased life expectancy of the lamps with controlled dimming
  - Energy Efficiency

- Together with a presence detector an ideal solution for lighting control in many commercial projects !

Webinar “Constant Light Control with KNX”
Typical Projects

- Office Building
  - Small rooms, open-plan offices

- School
  - Class rooms

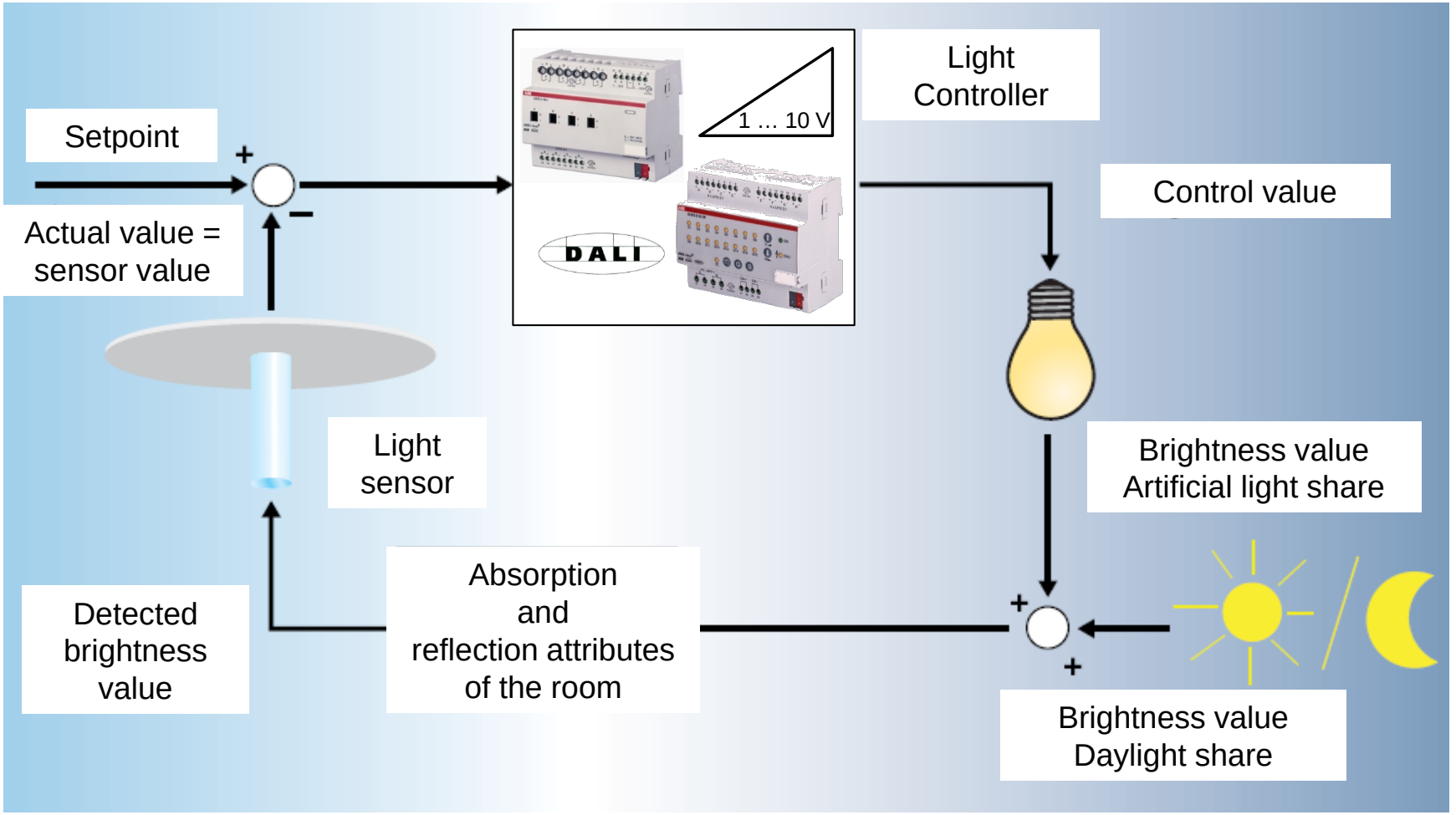
Webinar “Constant Light Control with KNX”
Typical Projects

- Public Building
  - Administration buildings, Library

- Industrial Facility
  - Assembly Hall

Further projects: Airport, Hospitals, …

Webinar “Constant Light Control with KNX”
Principle Schematic



Webinar “Constant Light Control with KNX”
Principle

- In constant lighting control a light sensor installed on the ceiling measures the luminance of the surfaces in its detection range, e.g. the floor or the desks.
- This measured value (actual value) is compared with the pre-defined setpoint value, and the control value is adjusted so that the divergence between the setpoint and actual values is minimal
- If it is brighter outside, the share of artificial lighting is reduced
- If it is darker outside, the share of artificial lighting is increased




Webinar “Constant Light Control with KNX”
Principle

- With the measurement of the brightness in the room the main causes of interference are detected, e.g. darkness due to shutters or partial shading due to buildings directly opposite
- This is different from a solution with an external brightness sensor installed outside at the façade, where effects like shading of the window with blinds cannot be detected (no closed loop control)
- An almost perfect level of brightness is therefore achieved in the room without the external influences




Webinar “Constant Light Control with KNX”
Principle

- To implement it a **dimming actuator**, a **controller**, a **brightness sensor** mounted in the ceiling is required
- A push button for activation or deactivation of constant light control, to switch on and off the light or for manual dimming is recommended

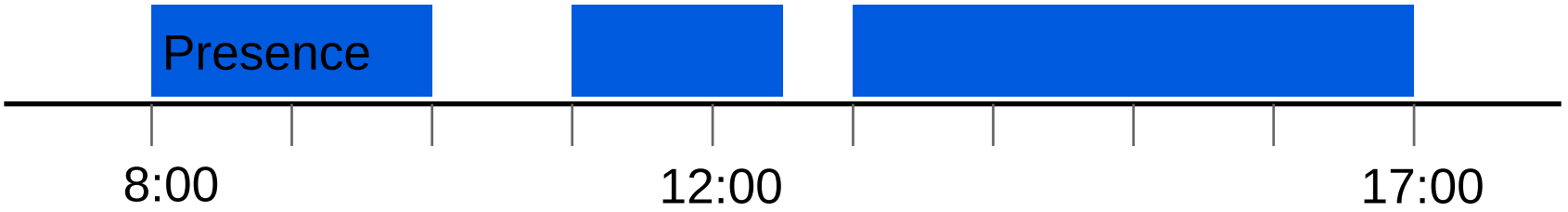
Webinar “Constant Light Control with KNX”
Energy Saving

Required light level = **Setpoint** (100%), e.g. 500 Lux

Measured brightness on the desk by means of day light

Webinar “Constant Light Control with KNX”
Energy Saving

Required light level = **Setpoint** (100%), e.g. 500 Lux
Actual light value: Daylight **plus** artificial light

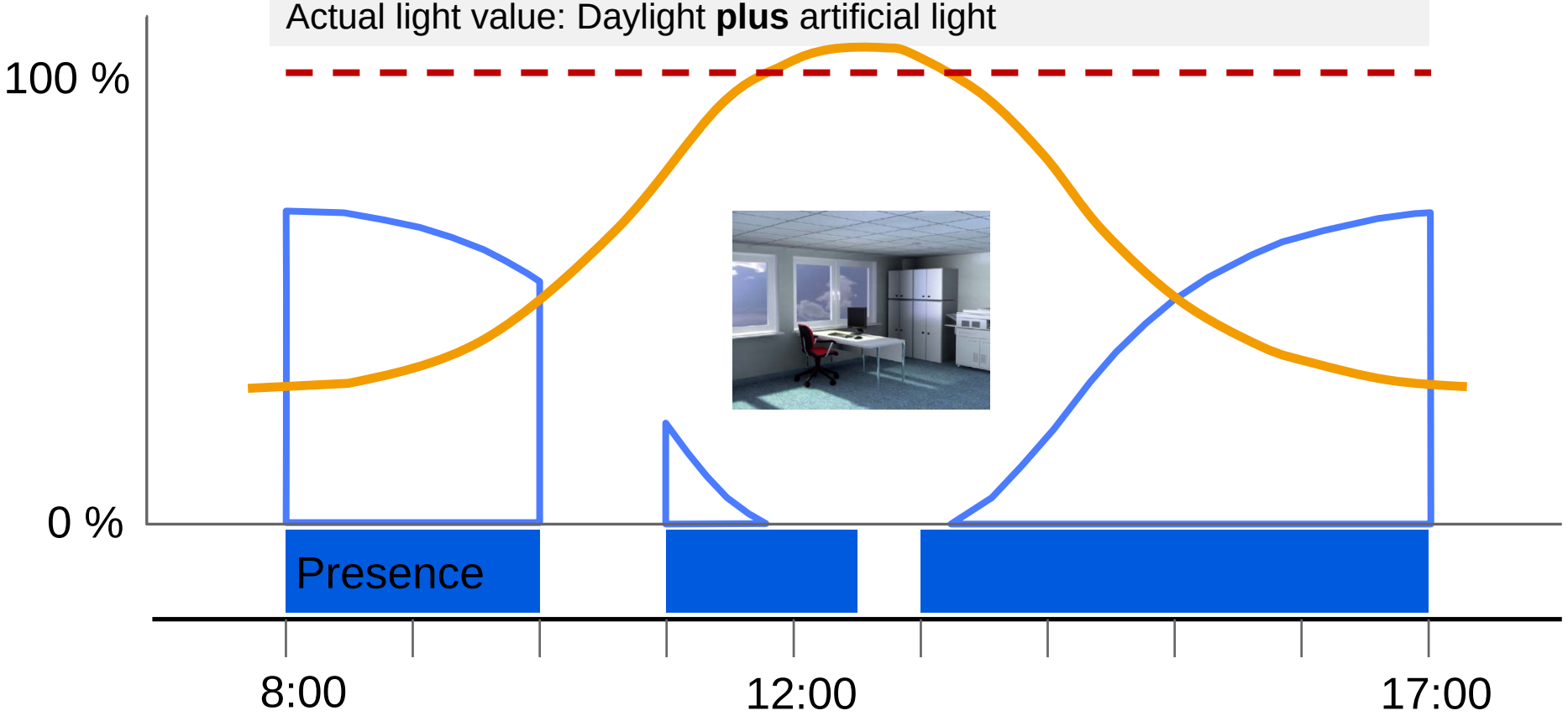


Measured brightness on the desk by means of day light

Additional artificial light

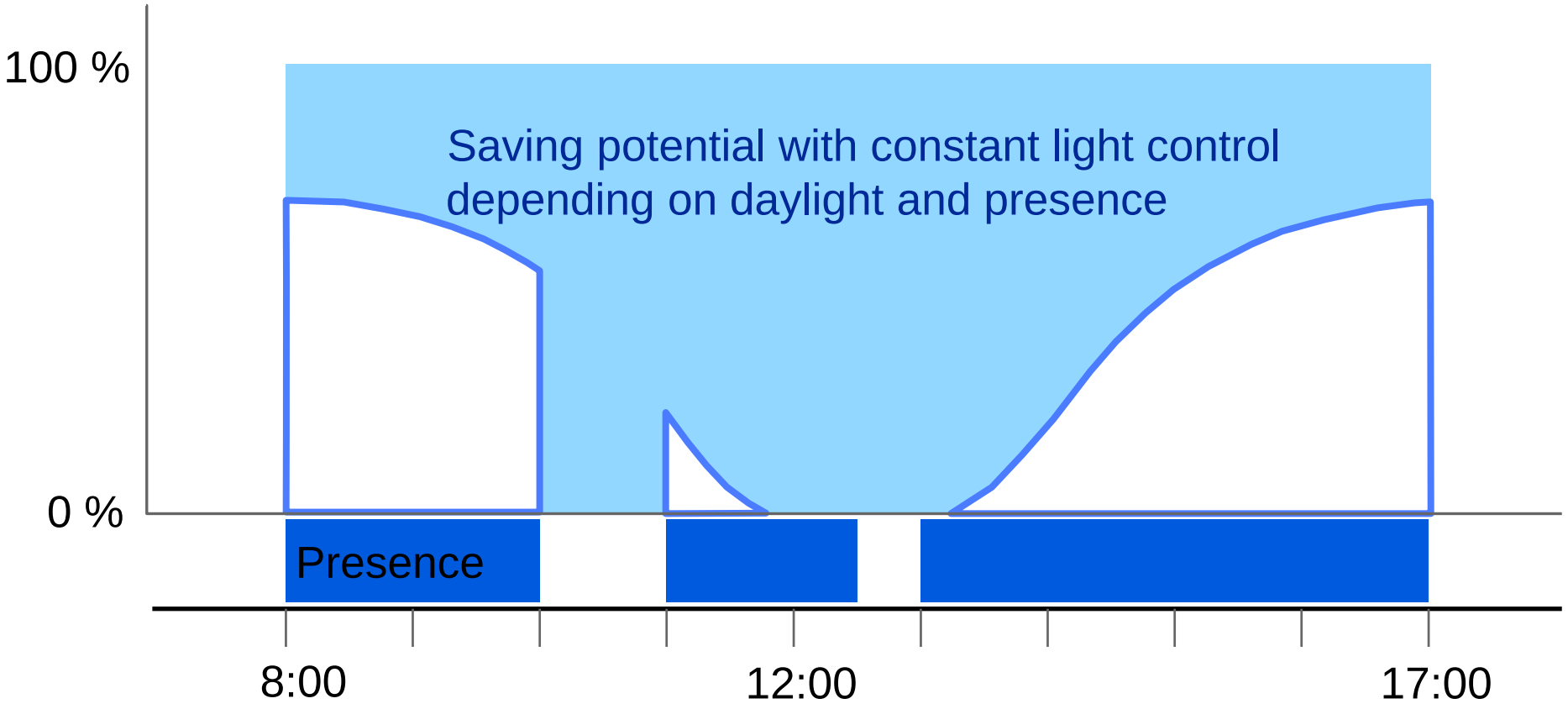
Webinar “Constant Light Control with KNX”
Energy Saving

Required light level = **Setpoint** (100%), e.g. 500 Lux
Actual light value: Daylight **plus** artificial light

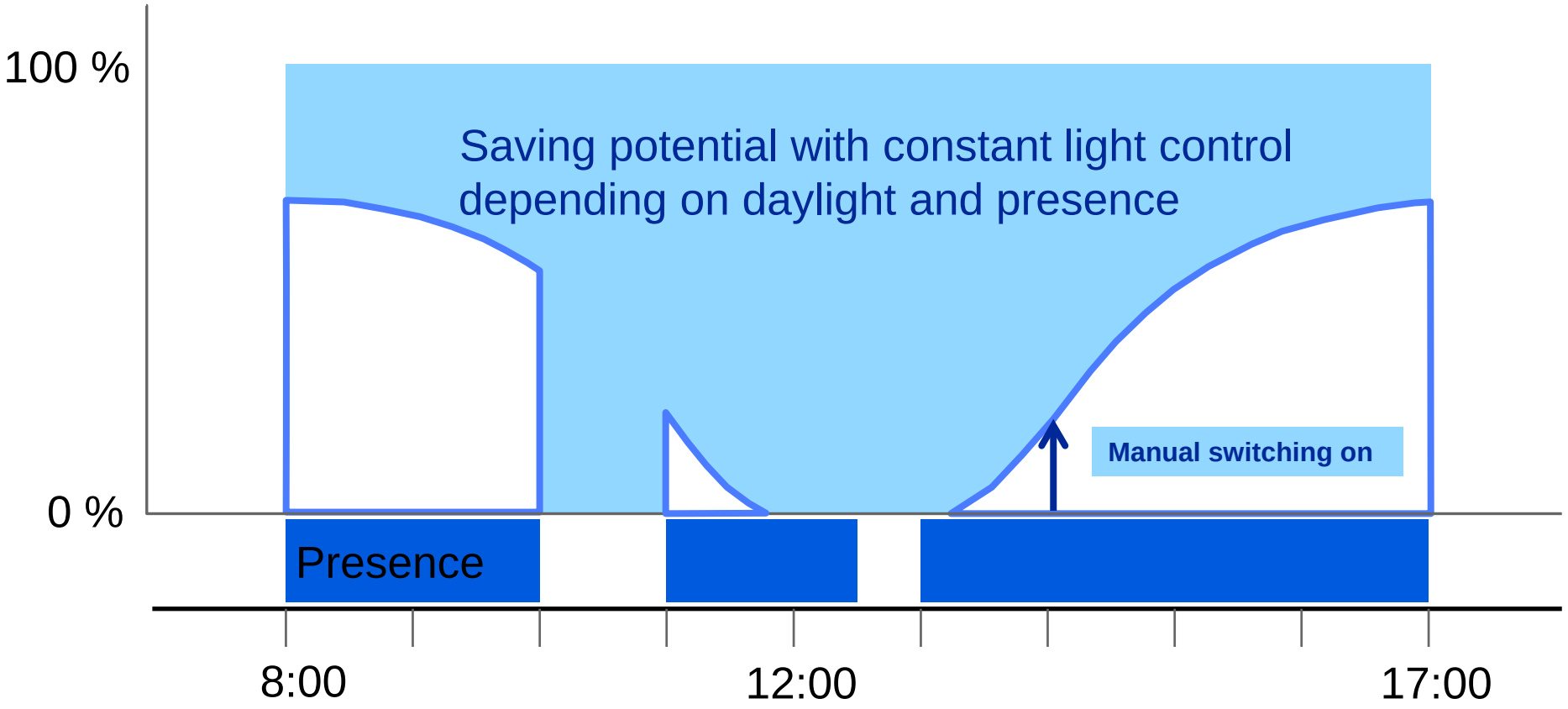


Required light level of additional artificial light

Webinar “Constant Light Control with KNX”
Energy Saving



Webinar “Constant Light Control with KNX”
Energy Saving

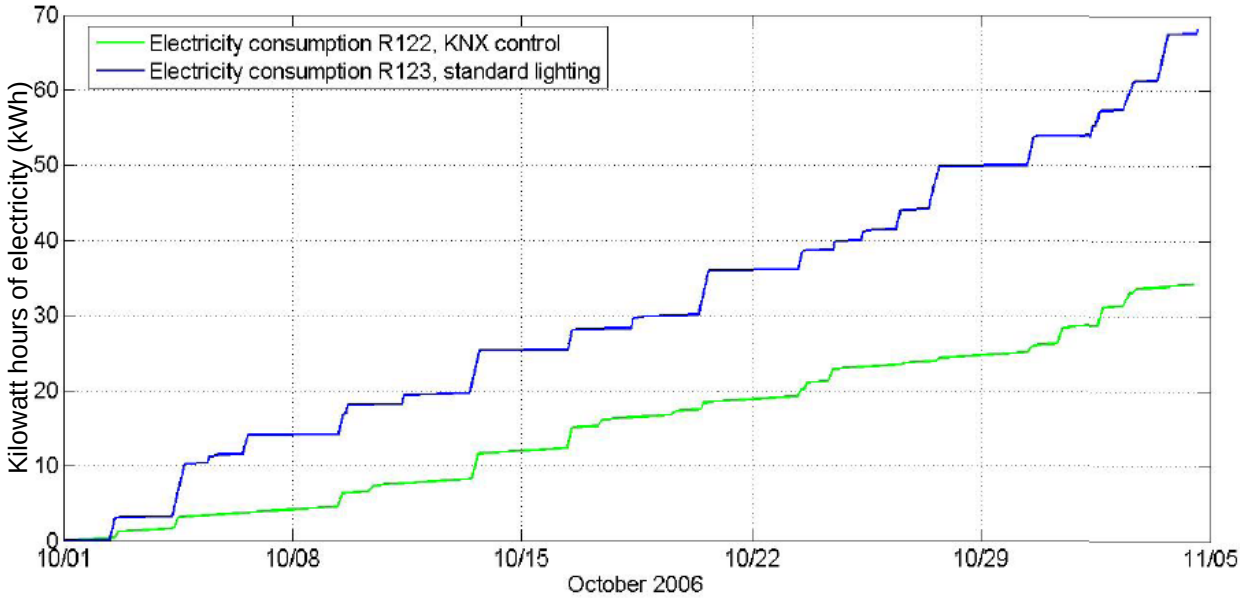


Webinar “Constant Light Control with KNX”
Energy Saving

- By combining constant light control and presence detection **up to 50% energy savings** are possible in a reference building according to DIN V 18599 resp. EN 15232 in comparison to manual switching (ON / OFF).
- These values have been confirmed with ABB's own theoretical calculations and measurements in different rooms
- Constant light control can be realised either using a combination of light sensor and constant light controller or with the integrated light controller in presence detectors
- Additionally, the life expectancy of the lamps is increased with controlled dimming.

Webinar “Constant Light Control with KNX”
Study University of Bremen

University with Seminar Rooms:
Comparision of two Rooms (Energy for Light)



Daylight dependent light control with presence detection and two dedicated illuminance sensors for two groups of lamps

KNX Scientific Conference
Wien, 9.-10.11.2006

HOCHSCHULE BREMEN
UNIVERSITY OF APPLIED SCIENCES

SCIENTIFIC KNX

Webinar “Constant Light Control with KNX”
Amortisation

- Seminar room of 100 m² with approx. 1400 W of lighting (12 EVGs 2x58 W -> 1392 W)
- 41 weeks p.a. occupied for 5 h per day -> 2280 kWh (41 x 7 -> 287 x 5 -> 1435 x 1,4 -> 2009)
- At 25 ct/kWh the electricity costs are 570 € p.a. Using constant light control savings of 285 € p.a. (50%) are made.
  - Investment for the KNX devices

1/40	Power Supply	SV/S 30.640.3.1	9 €
1/4	Light Controller	LR/S4.16.1	107 €
1	Light Sensor	LF/U2.1	71 €
1	Push Button Interface	US/U2.2	59 €
3/4h	Parameterisation and adjustment		45 €
			---
			291 €

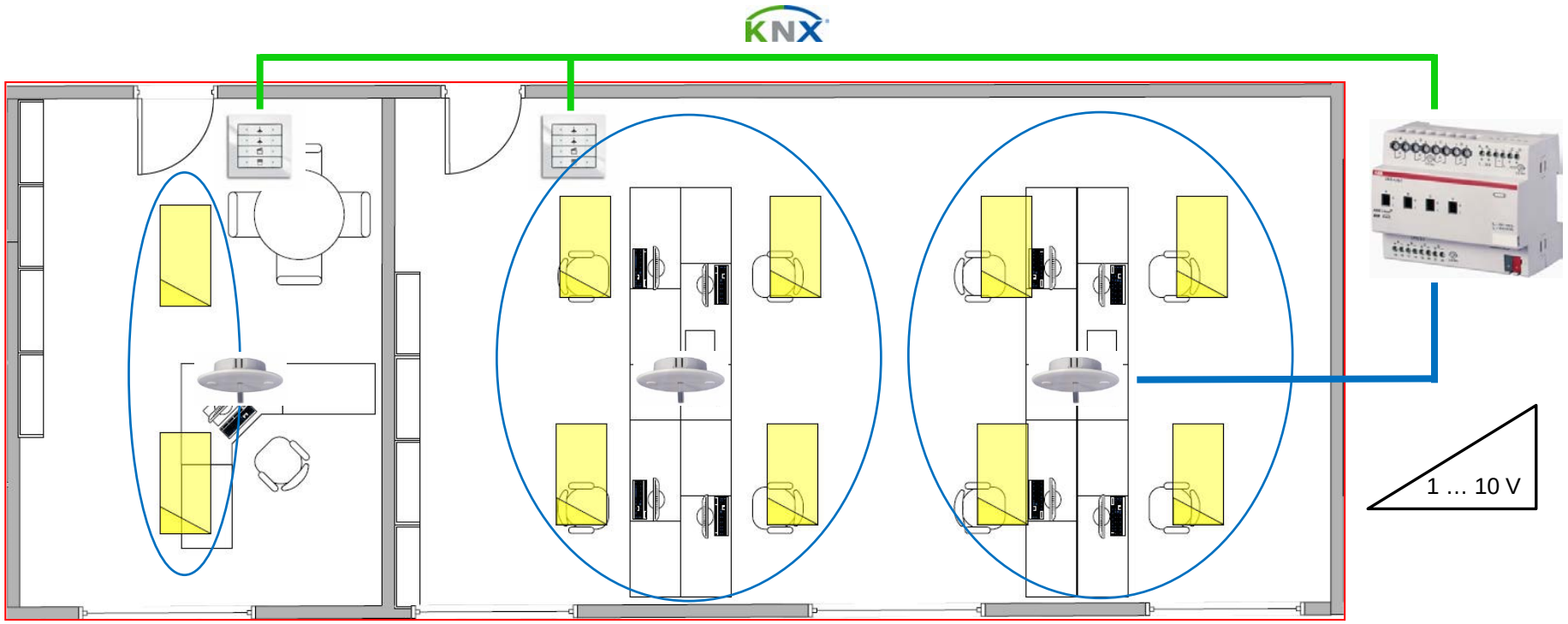
- **The pay back period for the allocatable investment is around 1 years.**

* A prerequisite for constant light control is the utilisation of dimmable lighting in 1-10 V or DALI technology. Dimmable DALI lighting also offers additional cost saving benefits e.g. maintenance (lamp failure) or flexibility

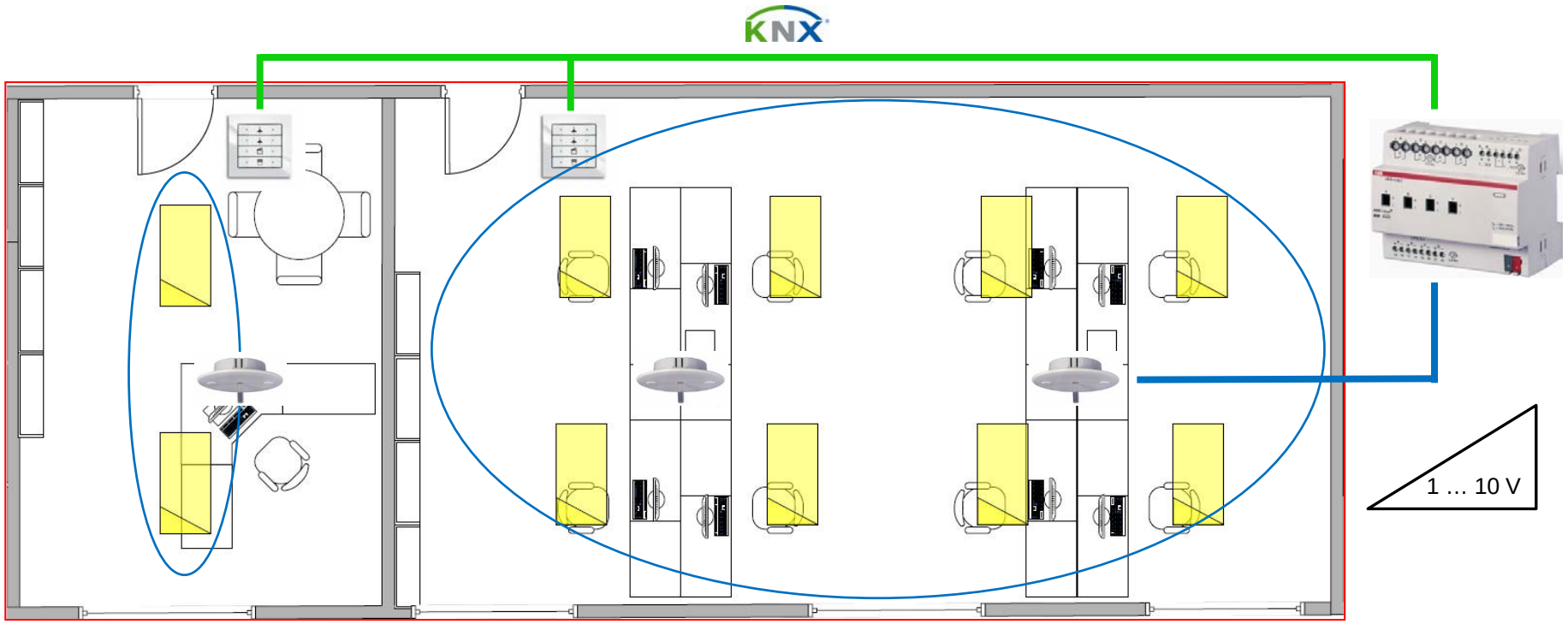
Webinar “Constant Light Control with KNX”
LR/S x.16.1 – LF/U 2.1 (1-10V)

- Light controller LR/S x.16.1 (2- and 4fold)
- Light sensor LF/U 2.1

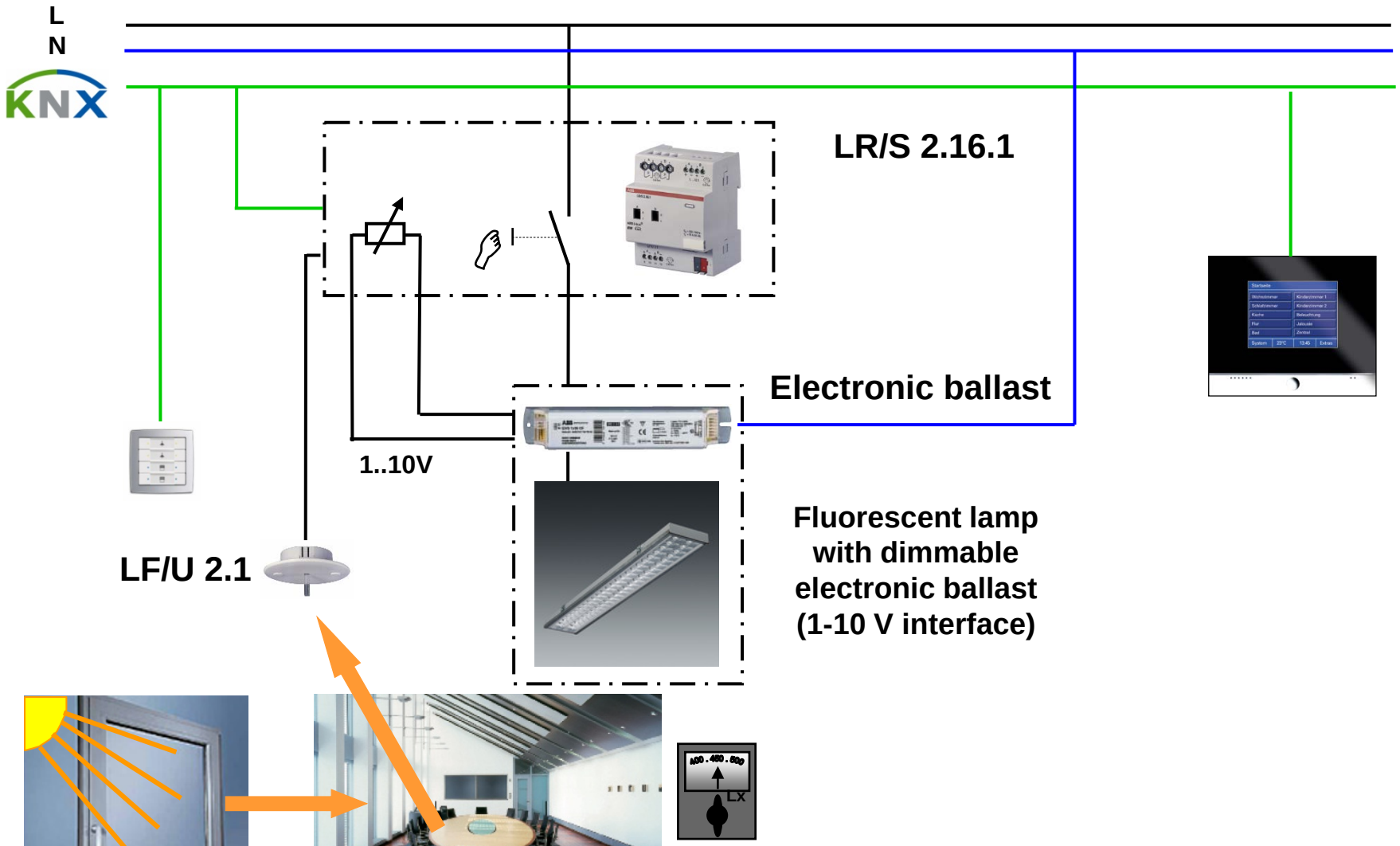
Webinar “Constant Light Control with KNX”
Constant Light Control with 1-10 V



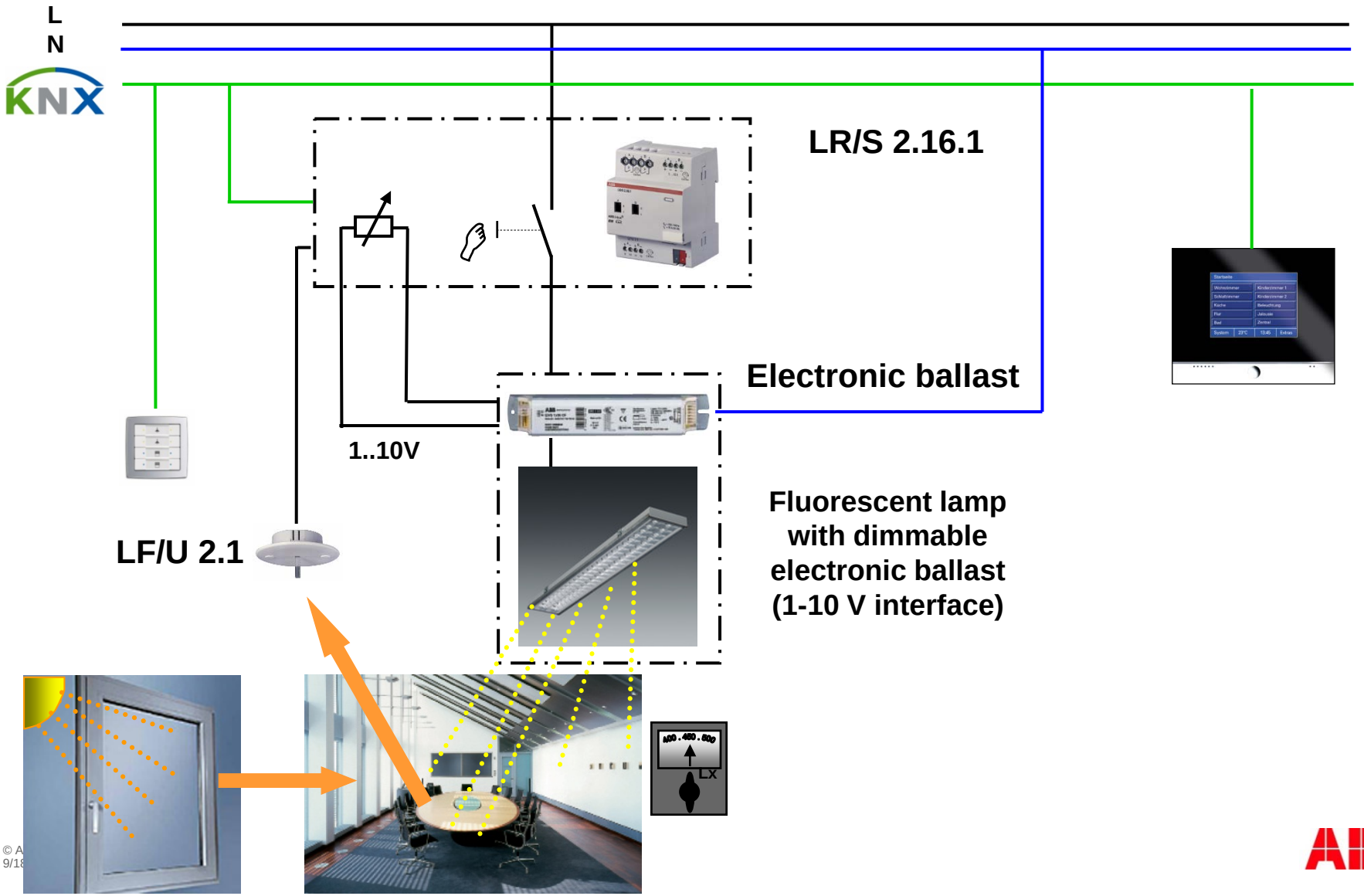
Webinar “Constant Light Control with KNX”
Constant Light Control with 1-10 V



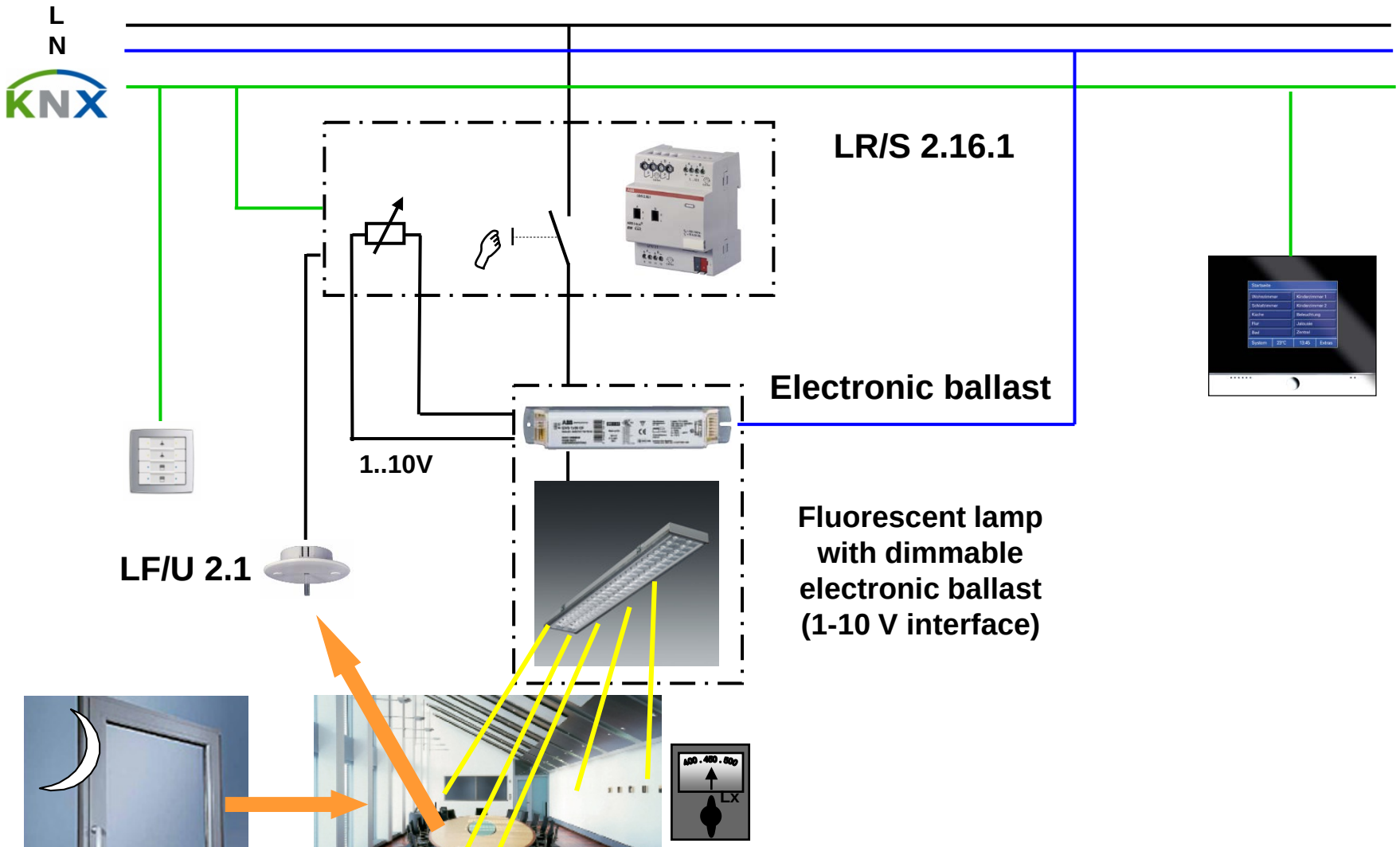
Lighting Control with Light Controller and Light Sensor Function – Day



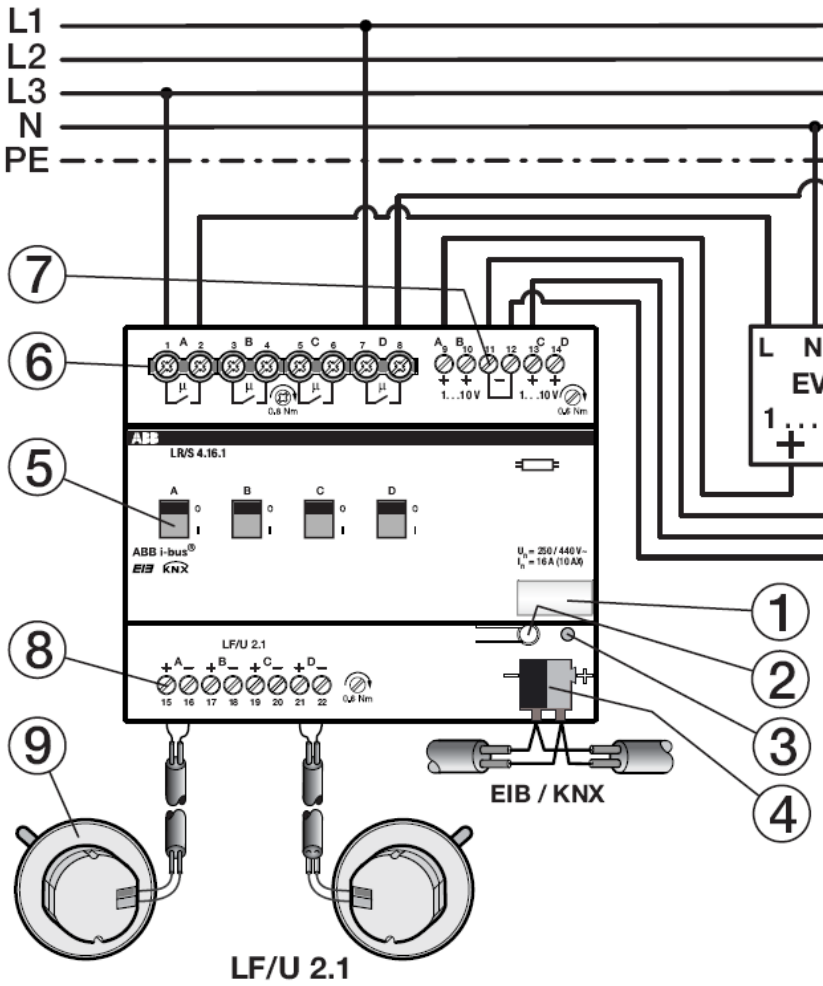
Webinar “Constant Light Control with KNX”
Function – Twilight



Webinar “Constant Light Control with KNX”
Function – Night



Webinar “Constant Light Control with KNX”
LR/S x.16.1 – LF/U 2.1



1 Label carrier
2 KNX programming button
3 Red KNX programming LED
4 KNX connection terminal
5 Switch position display and ON/OFF manual actuation
6 Load circuit, for each 2 screw terminals
7 Control circuits (1…10 V) for each 2 screw terminals
8 Light Sensor inputs, for each 2 screw terminals
9 Light sensor LF/U 2.1

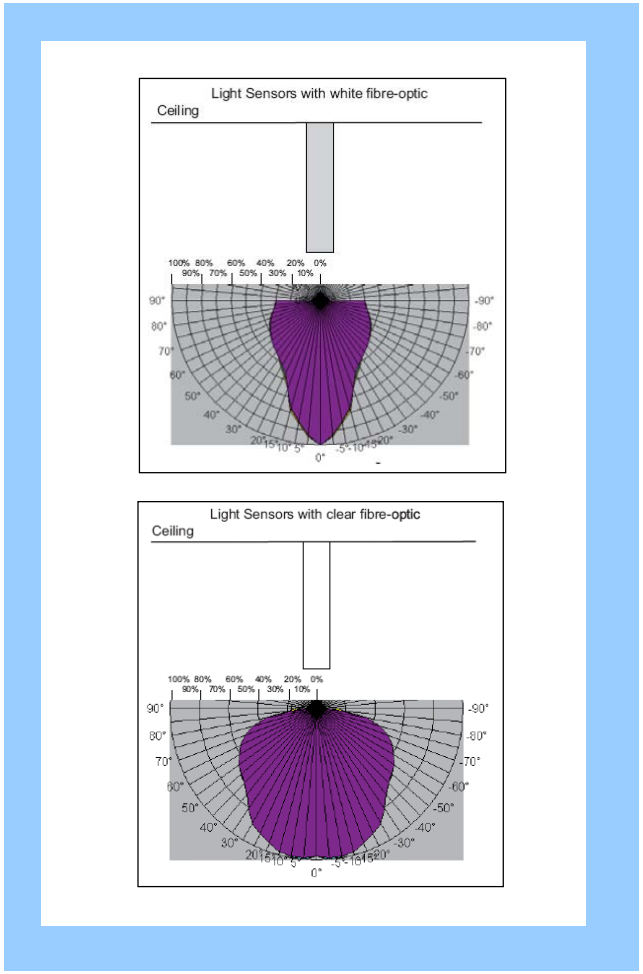
Webinar “Constant Light Control with KNX”
Light Controller LR/S x.16.1

- LR/S 2.16.1 and LR/S 4.16.1
- 2 / 4 independent outputs
- 16A – AC1, 10AX
- 1-10V control output max. 100mA max. 100m cable length
- 2 / 4 inputs for LF/U 2.1 max. 100m shielded cable

Webinar “Constant Light Control with KNX”
Light Sensor LF/U 2.1

- Sensor adapted to Light Controller LR/S x.16.1 or DALI Light Controller DLR/S 8.16.1M and DLR/A 4.8.1.1
- Evaluated brightness detection with integrated light filter
- Brightness detection optimised for 500 Lux
- 200 ..1200 Lux for rooms with average furnishing level (degree of reflection 0.5)
- Setpoint adjustment and calibration via i-bus® tool
- More than one setpoint possible

Webinar “Constant Light Control with KNX”
Light Sensor LF/U 2.1



- The Light Sensor includes two light rods
- The white fibre-optic rod has a smaller detection range and is less sensitive to lateral lighting influences
- This rod can be used if the detection range has to be limited as the reflected light may be influenced, for example, by window sills which affect the large reference area of the clear fibre-optic rod

Webinar “Constant Light Control with KNX”
Light Sensor LF/U 2.1

- Position the sensor as deep as possible in the room but not directly in front of reflecting walls
- Ensure that the sensor is not subject to direct sunlight or sources of artificial lighting
- The optimum installation height is between 2 and 3 m

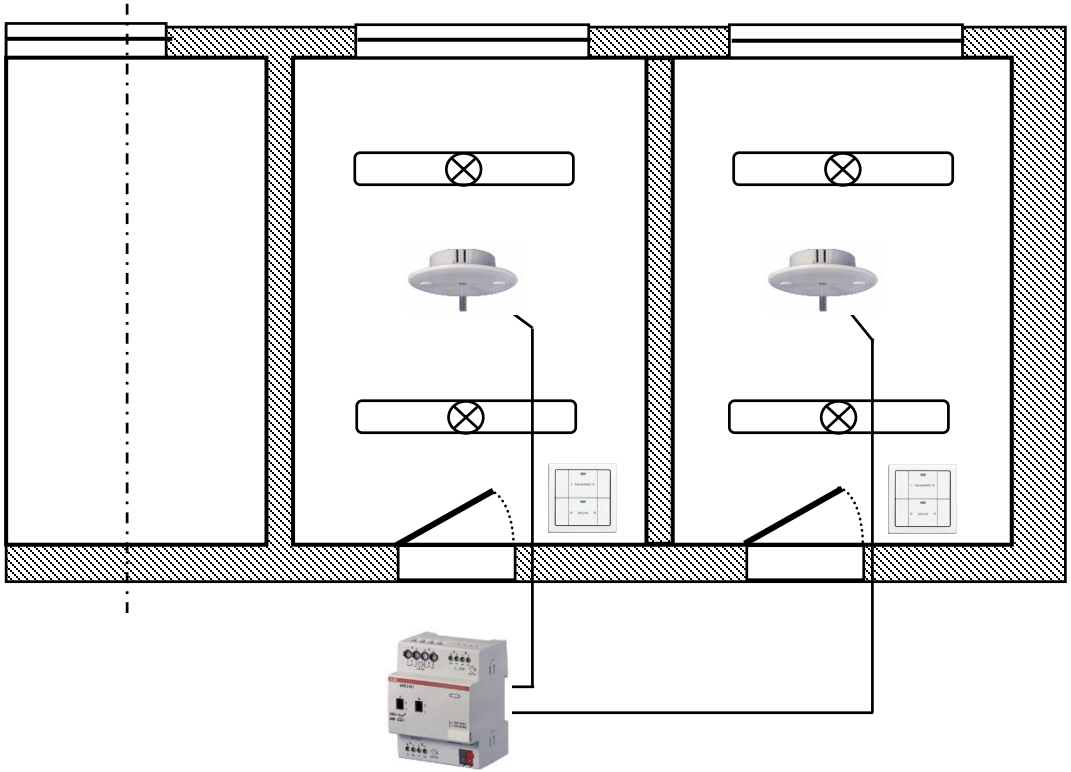
Webinar “Constant Light Control with KNX”
Light Sensor LF/U 2.1

- The Light Sensor LF/U 2.1 will be installed in the ceiling next to the area to be regulated, e.g. in an office above the working desk
- The light Sensor detects the „reflected brightness“ of the illuminated media – the light density
- Another brightness value to be measured is the illumination level, collected by a lux meter
- With the same illumination level but differently reflective media, e.g. dark and bright carpet, variable light densities will be visible

- In practice due to this and further reasons there won‘t be an absolut precise regulation, deviations of +/– 10 to 20 % from setpoint will exist
- This tolerance has no practical meaning and is uncritical for the eye and feeling of the human being
- Speed of regulation should be slow (parametrizable), change of brightness won‘t be hardly recognized

Webinar “Constant Light Control with KNX”
LR/S x.16.1 – LF/U 2.1

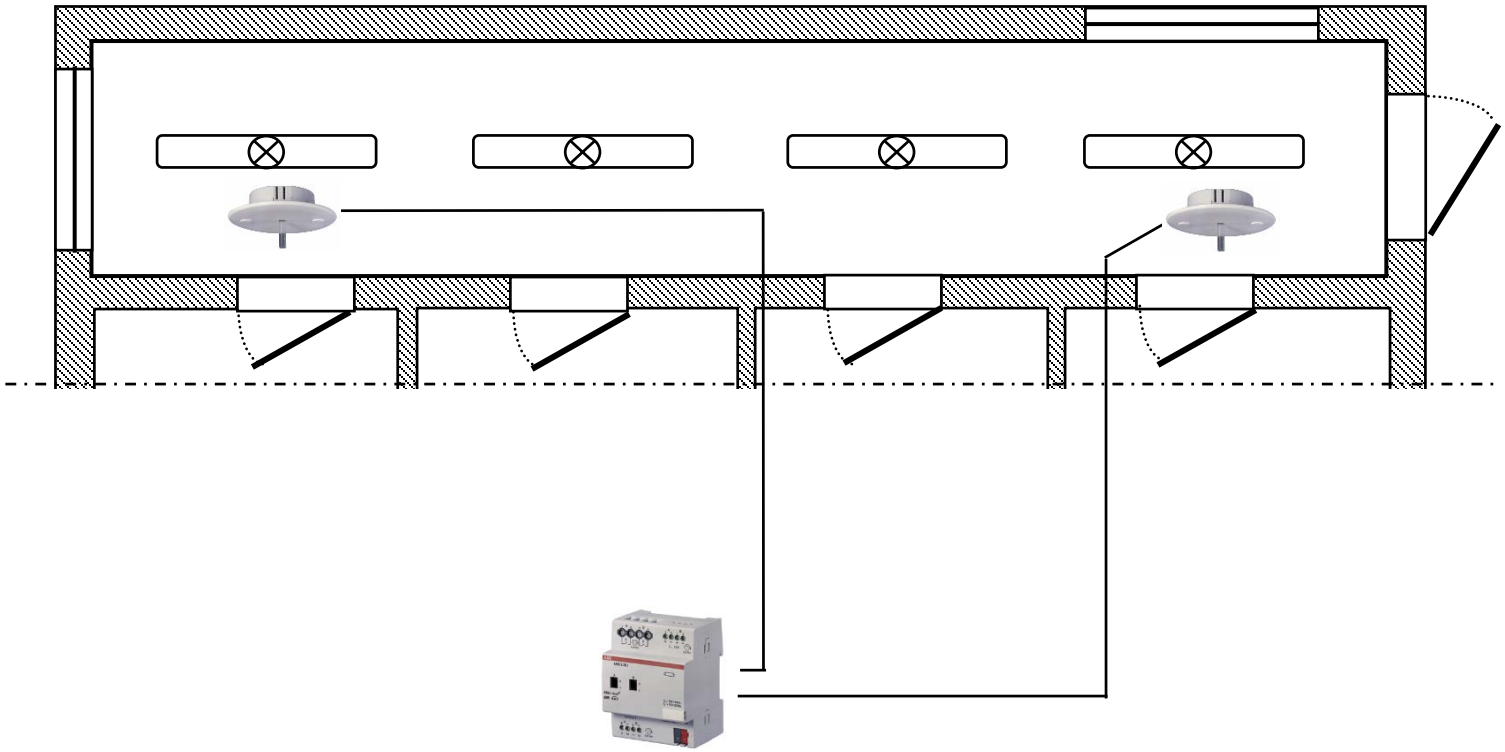
- Constant light control in two rooms



Light Controller LR/S 2.16.1

Webinar “Constant Light Control with KNX”
LR/S x.16.1 – LF/U 2.1

- Constant light control in a long floor or open-plan office with 2 sensors



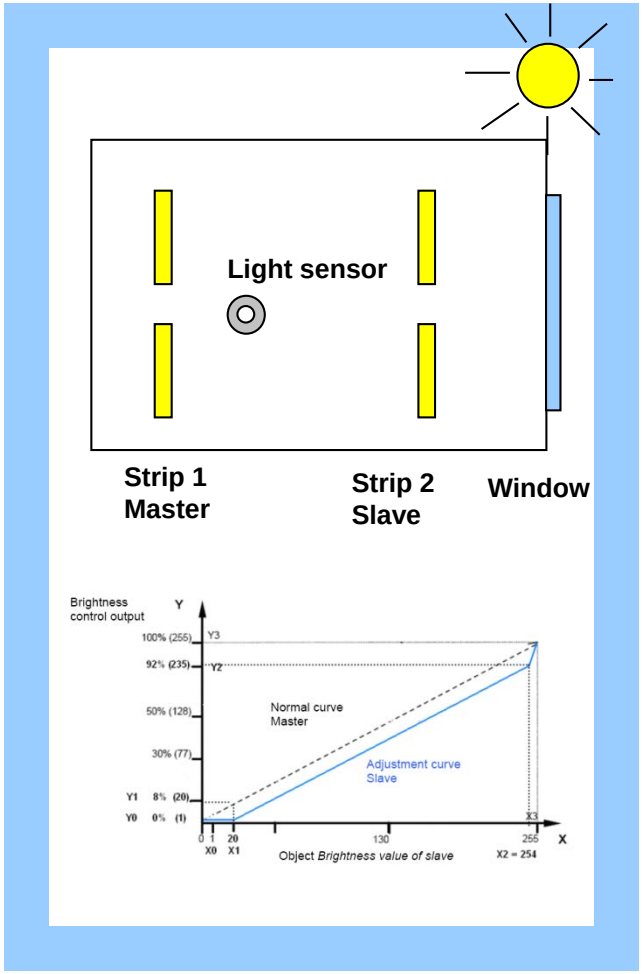
Light Controller LR/S 2.16.1

Webinar “Constant Light Control with KNX”
LR/S x.16.1 – LF/U 2.1

Application program and functions

- Controller specific parametrisation
  - Individual allocation of the sensors (2 or 4) to the channels
  - More than one sensor can be assigned to one channel
  - Evaluation of upper, lower or average sensor value
  - One channel can be Master or Slave
  - During constant light control an individual reaction on switch-, dim-, and preset/scene commands is adjustable
  - Dimming speed during brightness control
  - Brightness limits during brightness control

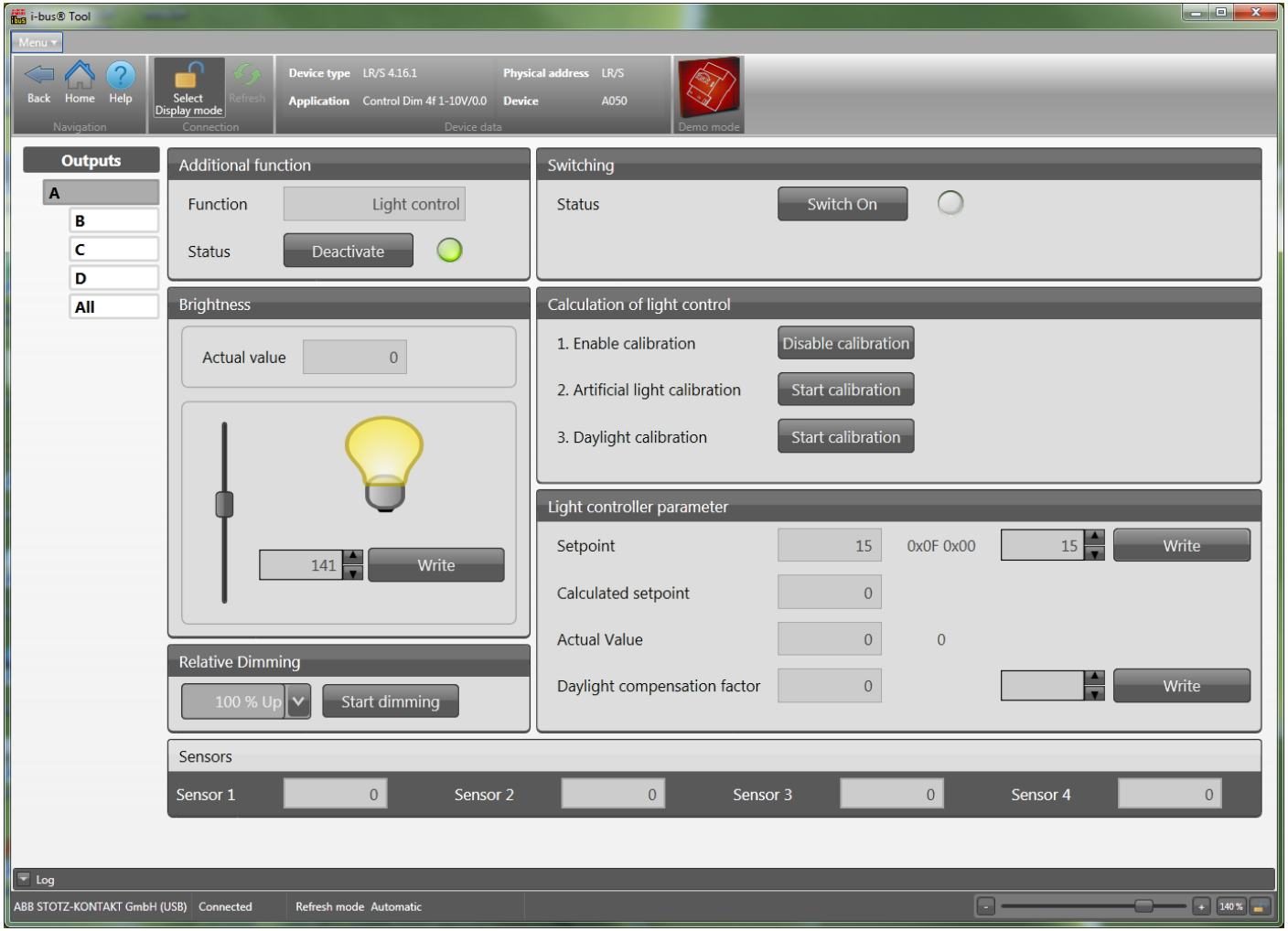
Webinar “Constant Light Control with KNX”
LR/S x.16.1 – LF/U 2.1



Application program and functions

- Characteristic Curve Adjustment
  - Strip 1 is connected to output A of the light controller and is parameterised as a master
  - Strip 2 is controlled via output B of the light controller and is parameterised as a slave with the a characteristic correction (darker minus 20 digits / 8%)
  - As soon as the master is switched on, the slave will also receive an ON command, however with the minimum brightness

Webinar “Constant Light Control with KNX”
i-bus® Tool to adjust Constant Light Control



Webinar “Constant Light Control with KNX”
LR/S x.16.1 – LF/U 2.1

Commissioning - calibration process

- **Luxmeter**, **i-bus® Tool**, (Light Control Tool or manual calibration process via ETS)
- Commissioning (Set Point Adjustment) carried out with automatic regulation during day- and artificial light calibration
- Adjust brightness set point (e.g. 500 Lux) only by means of artificial light (Night Mode)
- Start artificial light calibration
- Adjust brightness set point (e.g. 500 Lux) only by means of natural light (Day Mode)
- Start daylight calibration
- Alternatively the day light calibration can be conducted with a compensation factor (defines the relationship between daylight and artificial lighting)
- **HINT:** Room has to be set up completely ! (Furniture, Painting …)

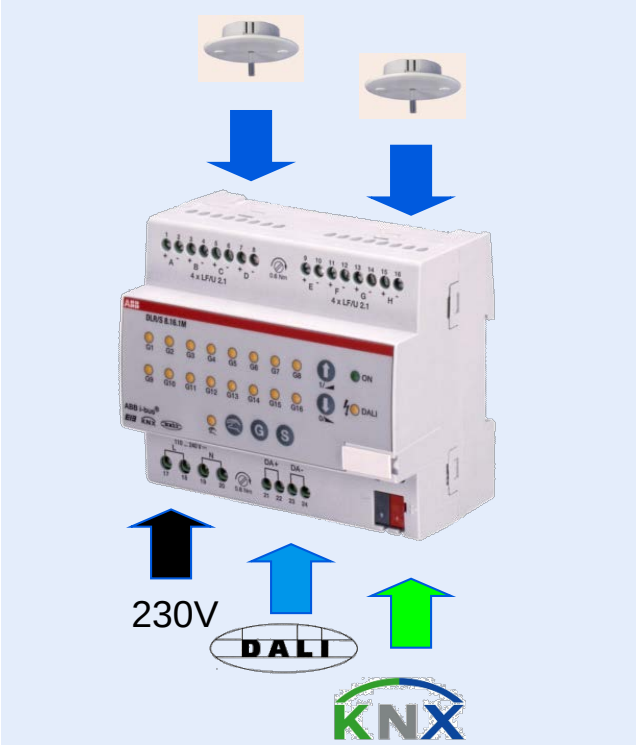
Webinar “Constant Light Control with KNX”
LR/S x.16.1 – LF/U 2.1

Manual daylight calibration

- If a daylight calibration is not possible, because the setpoint is not reached with the available daylight or a shading option is not available to darken the detection range of the Light Sensor so that the setpoint can be set, manual daylight calibration can be undertaken.

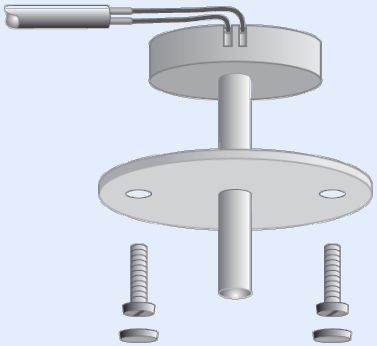
1. Enable manual daylight calibration (ETS-Parameter)
2. Load the factor for daylight calibration in the Light Controller with i-bus® Tool (Default 35)
3. Checking of controlled brightness value
4. The brightness is to be measured in the detection range of the Light Sensor with the Luxmeter
5. The factor must be reduced if the brightness is greater than the required setpoint
6. The factor must be increased if the brightness is too small
7. Repeat the steps until the required brightness is set

Webinar “Constant Light Control with KNX”
DALI Light Controller DLR/S 8.16.1M



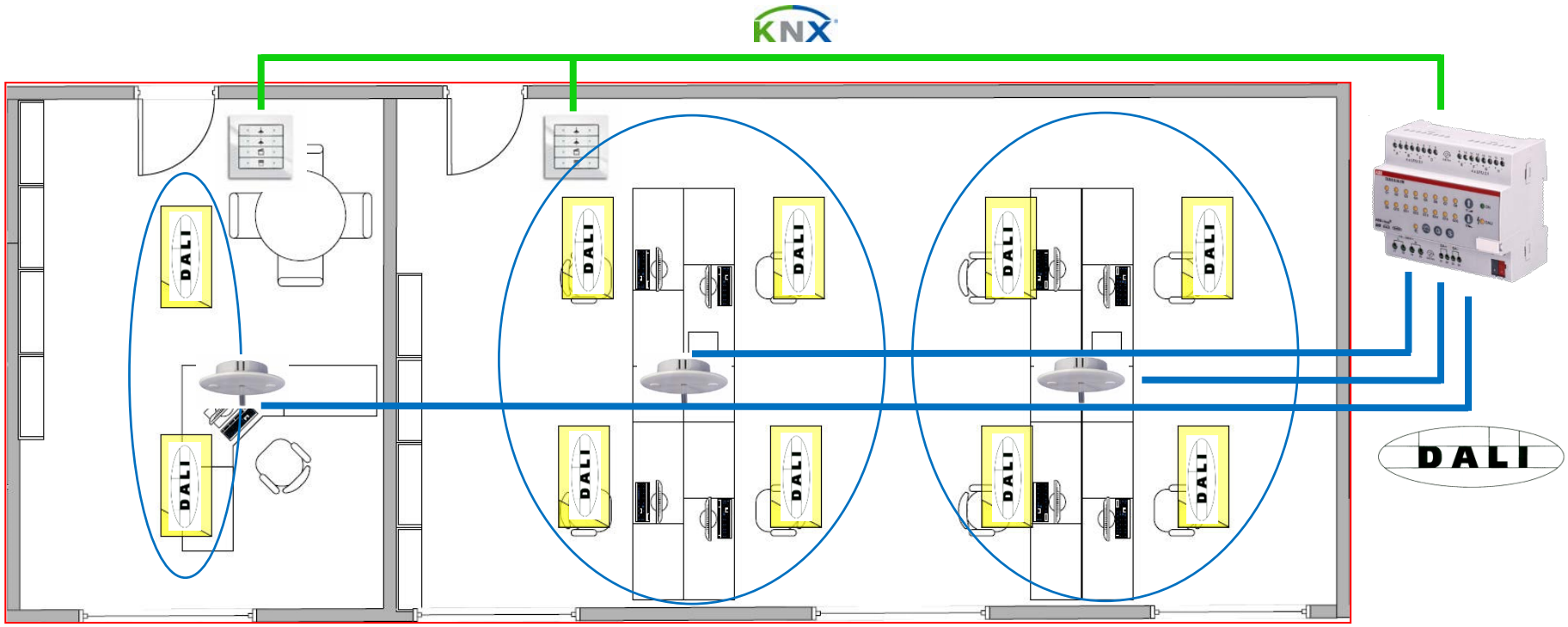
- One DALI control cable for 64 devices
- 16 DALI groups, 8 for constant light control
- 8 sensor inputs for LF/U 2.1
- 110…240 V AC/DC operating voltage
- Manual operation (Switching and dimming of DALI-groups, detection of ballasts)

Webinar “Constant Light Control with KNX”
Light Sensor LF/U 2.1

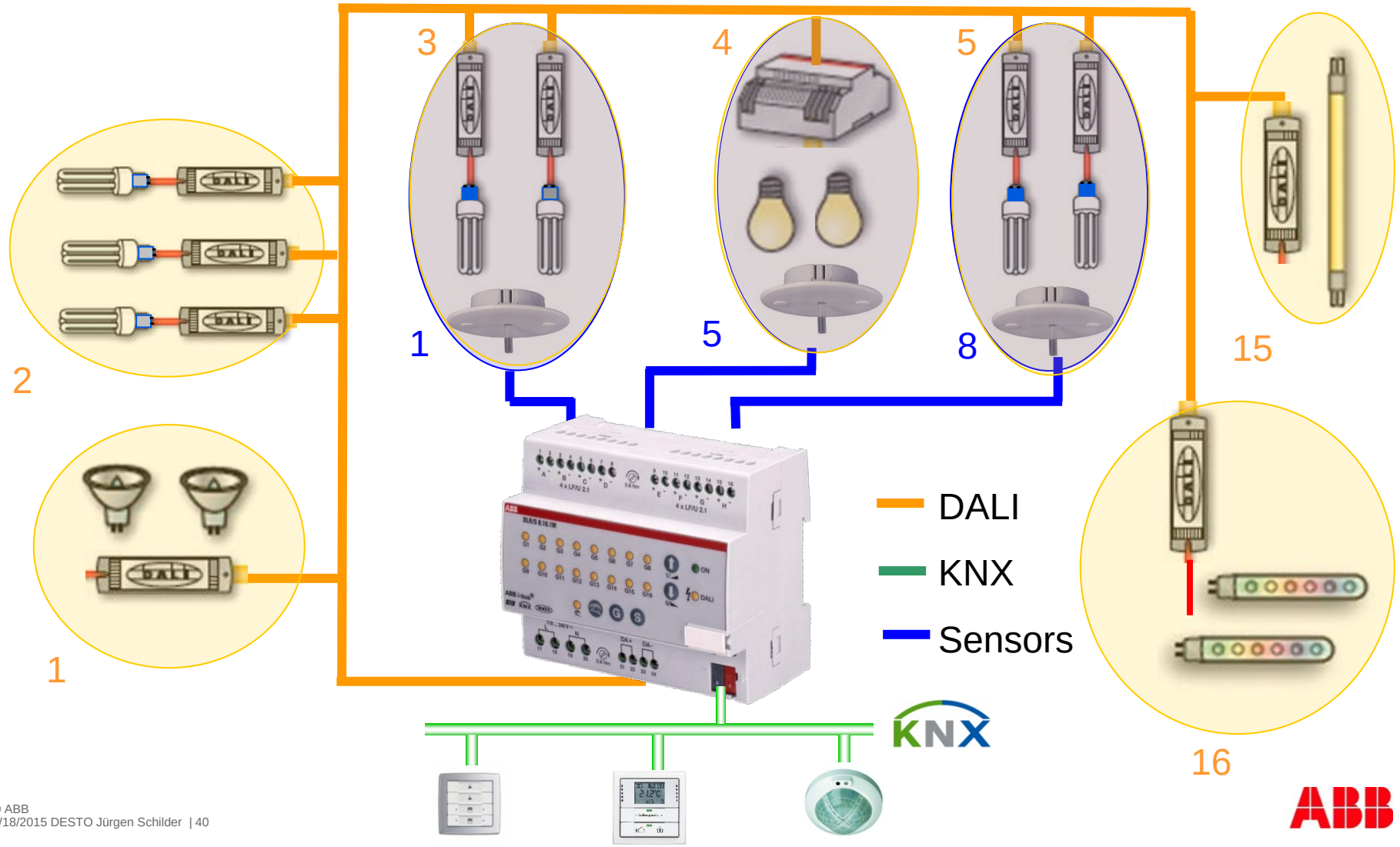


- Light Sensor LF/U 2.1
- Same sensor as for LR/S x.16.1

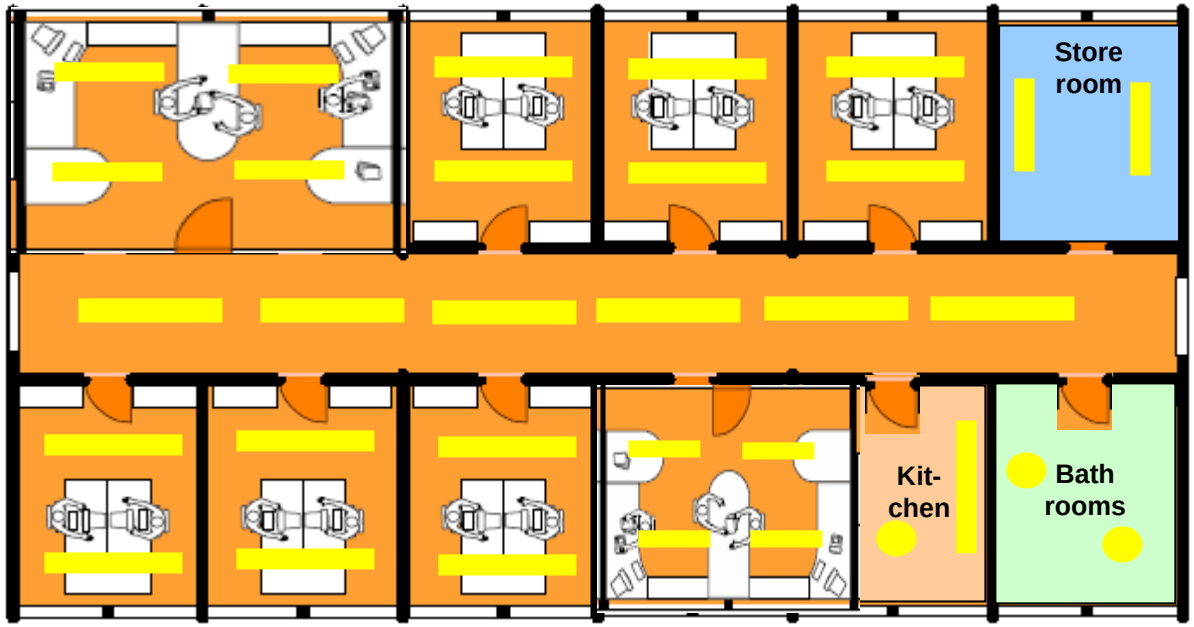
Webinar “Constant Light Control with KNX”
Constant Light Control with DALI



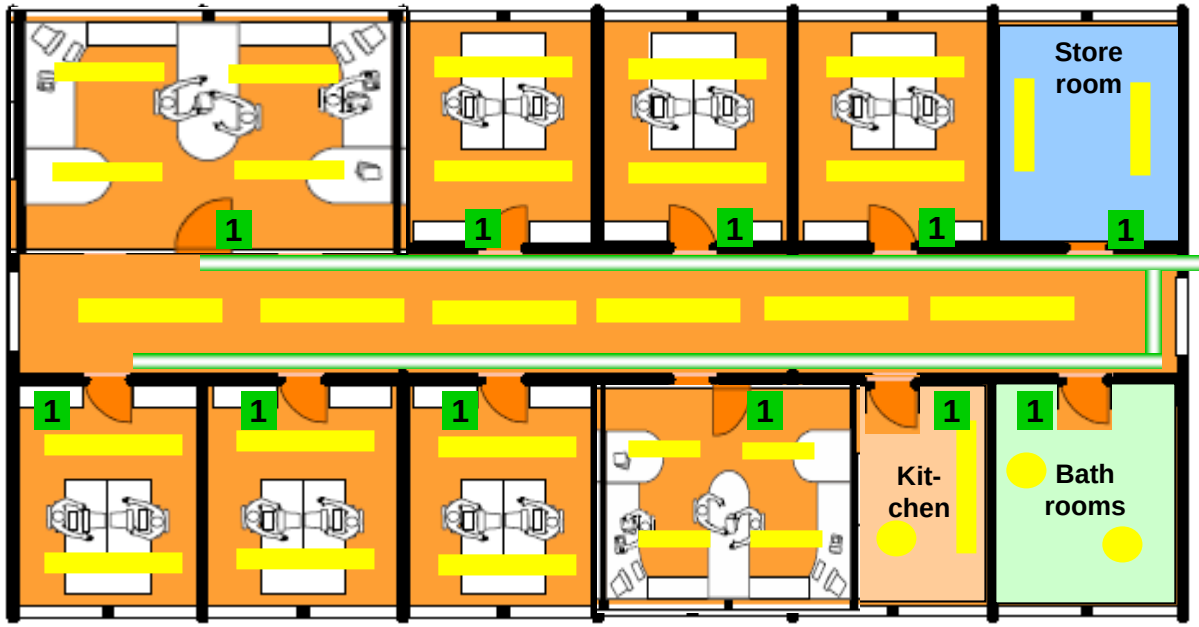
Webinar “Constant Light Control with KNX”
Connection Diagramm



Webinar “Constant Light Control with KNX”
Lighting Control in an Office

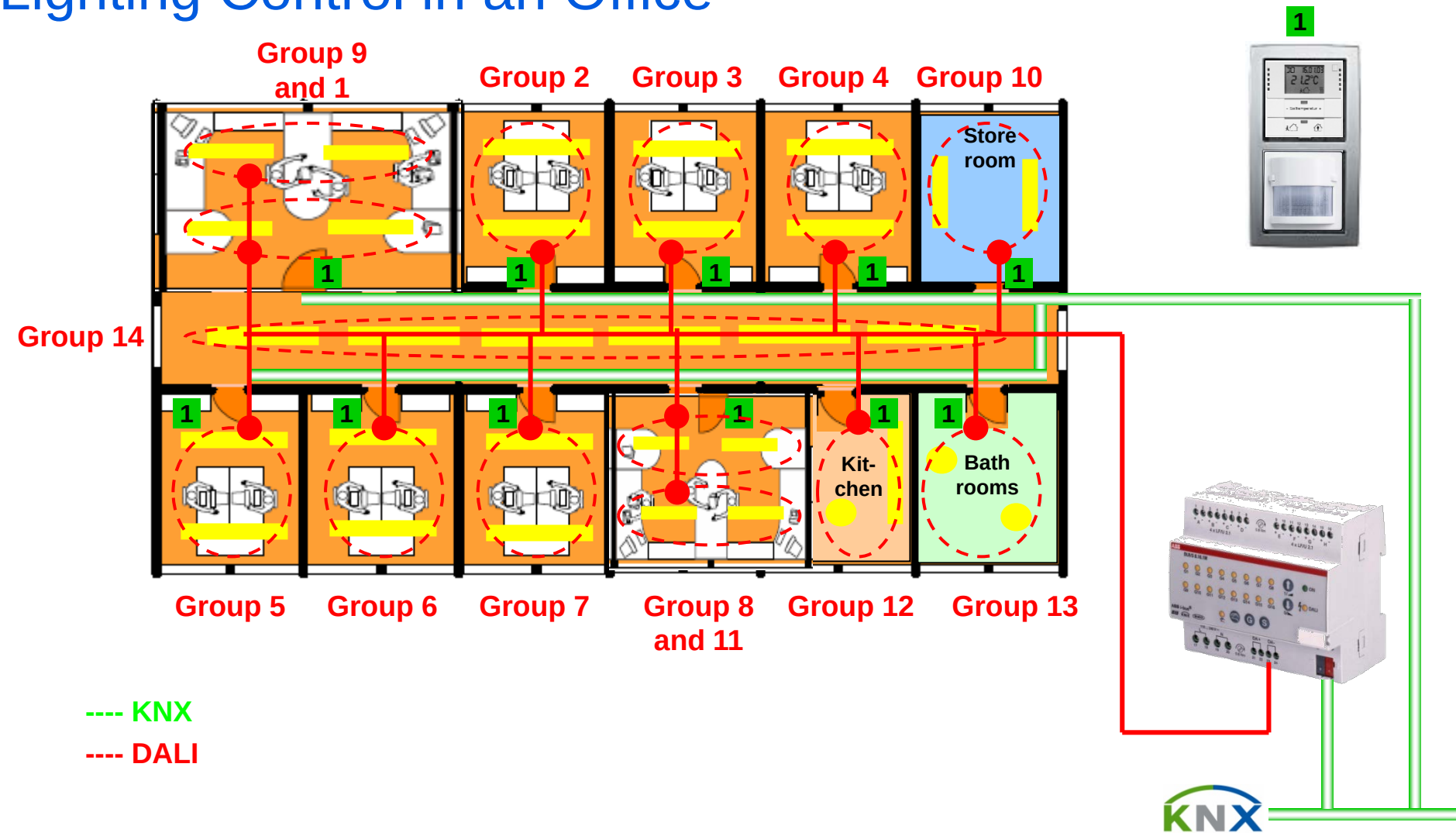


Webinar “Constant Light Control with KNX”
Lighting Control in an Office

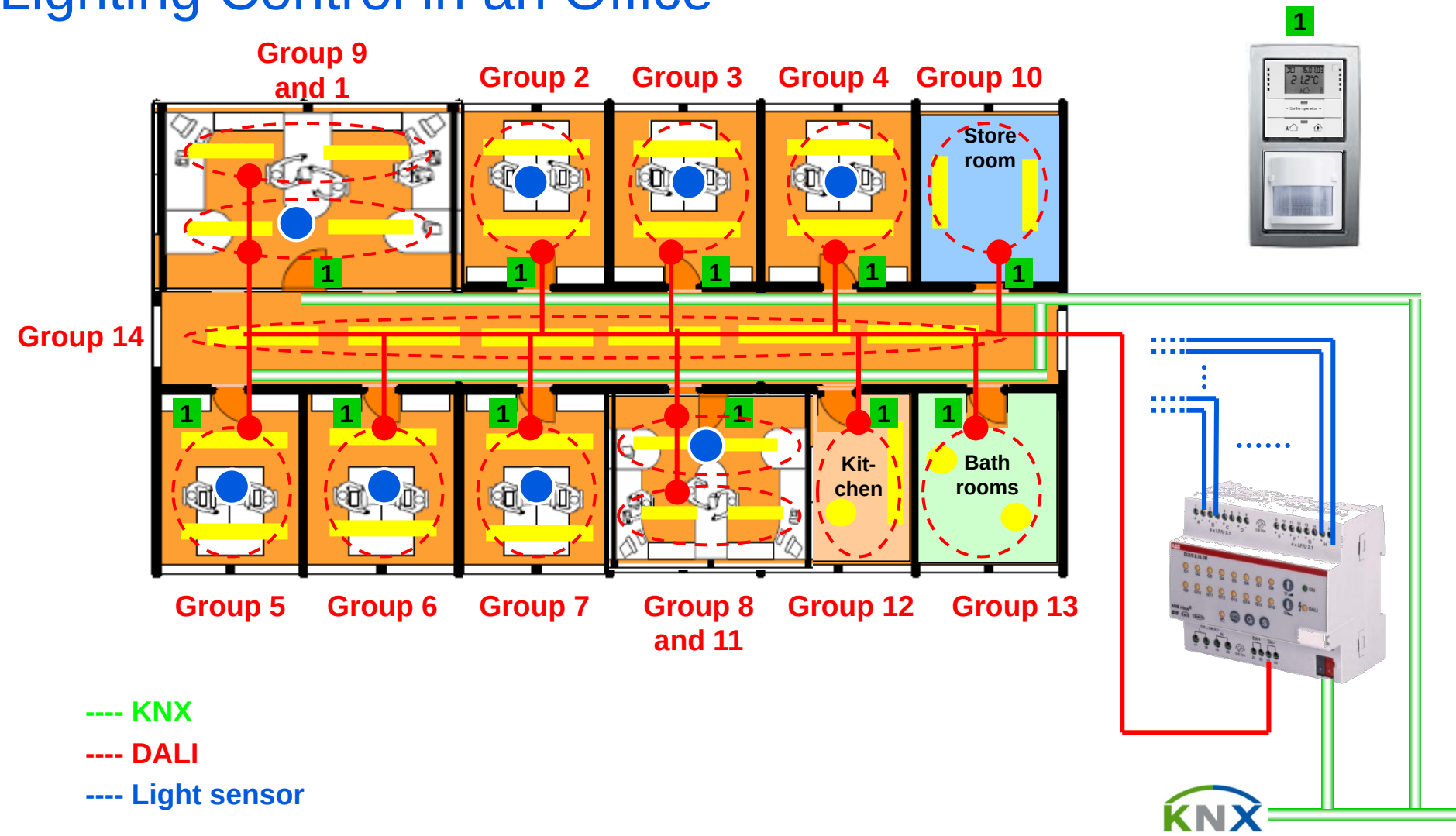


---- KNX

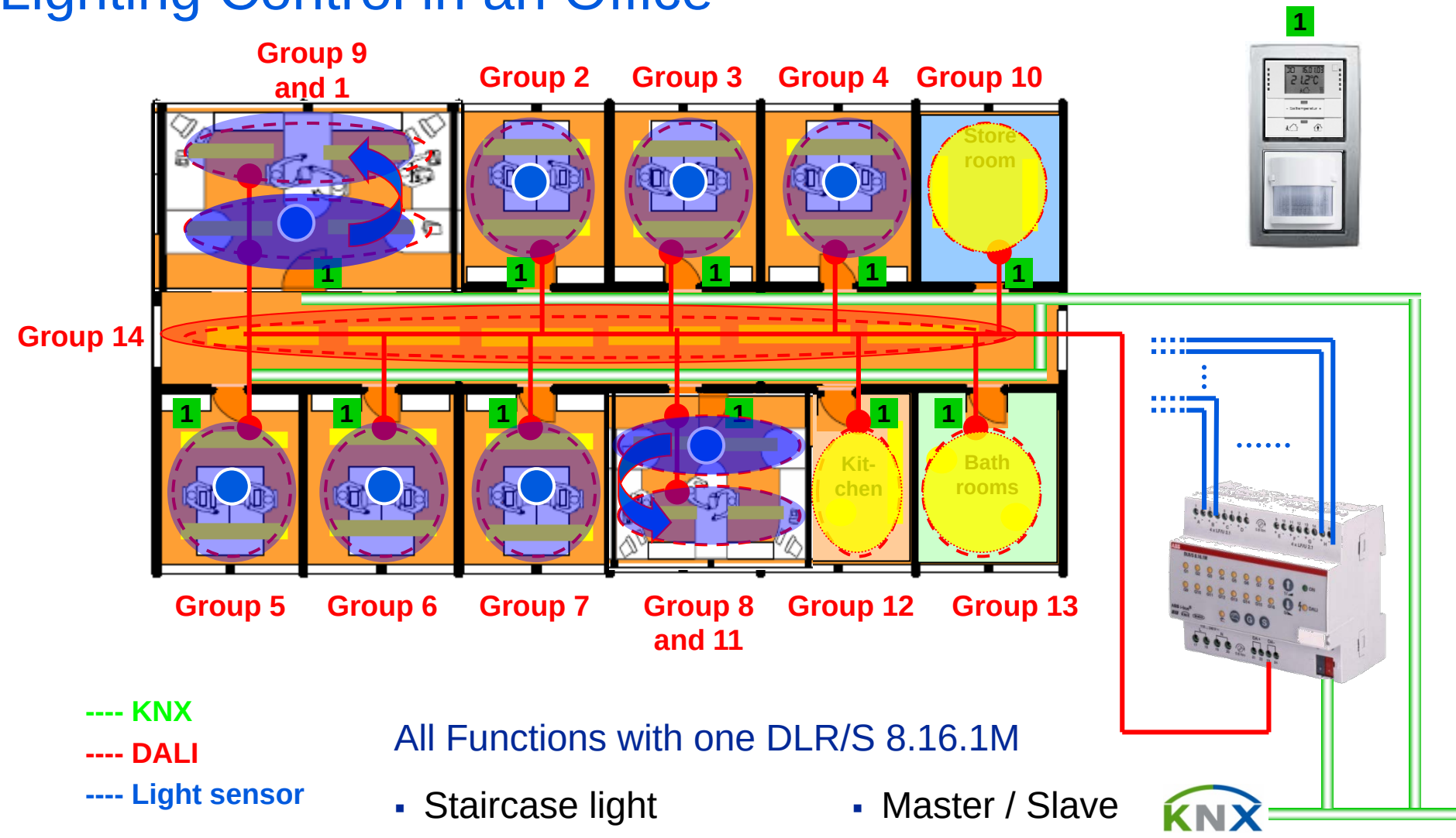
Webinar “Constant Light Control with KNX”
Lighting Control in an Office



Webinar “Constant Light Control with KNX”
Lighting Control in an Office



Webinar “Constant Light Control with KNX”
Lighting Control in an Office



---- KNX
---- DALI
---- Light sensor

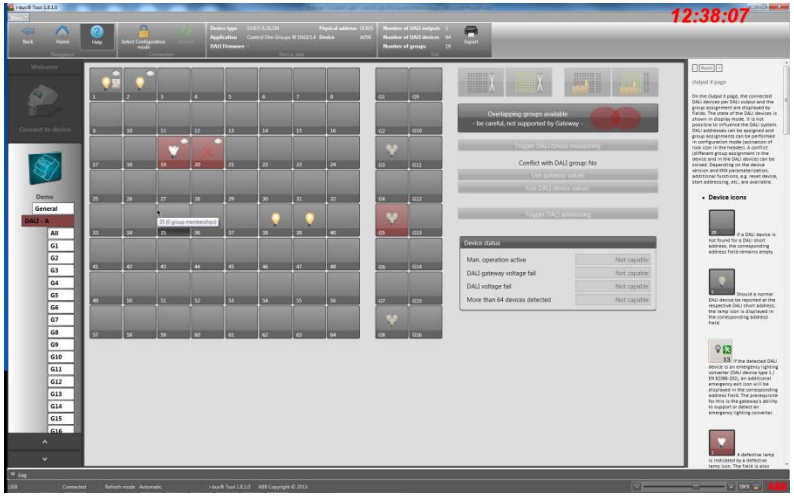
All Functions with one DLR/S 8.16.1M

- Staircase light
- Constant Light Control
- Master / Slave
- Switching / Dimming

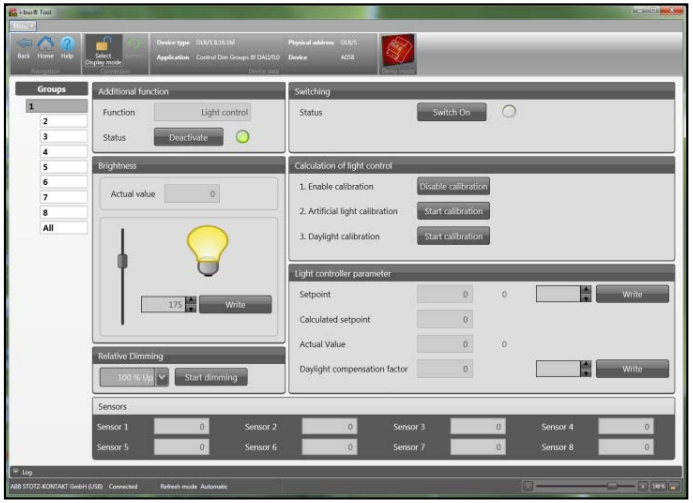
Webinar “Constant Light Control with KNX”
Commissioning

- Programming of the individual physical address (ETS), enable additional function “Light controller” and download application
- Optional readdressing of the DALI addresses and assignment of DALI-devices to DALI-groups (i-bus Tool)
- Set point adjustment/calibration process (i-bus Tool, same principle as LR/S x.16.1)
- Parameterisation of the ETS application
- Assignment of the communication objects to KNX group addresses
- Download of application

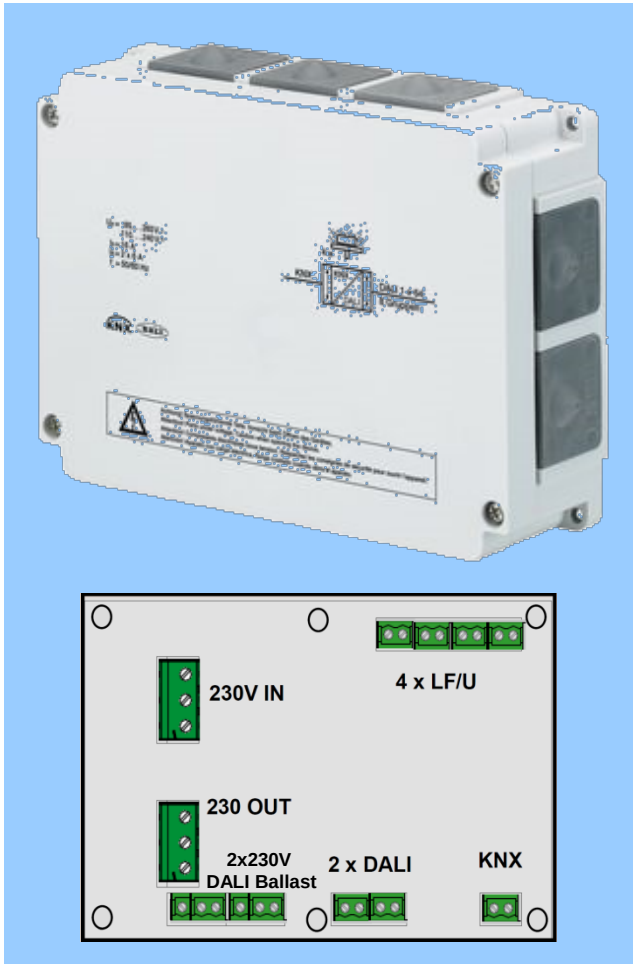
Webinar “Constant Light Control with KNX”
Commissioning



- i-bus® Tool to to detect DALI adresses, to assign DALI-devices to DALI-groups, …
- i-bus® Tool to adjust Constant Light Control

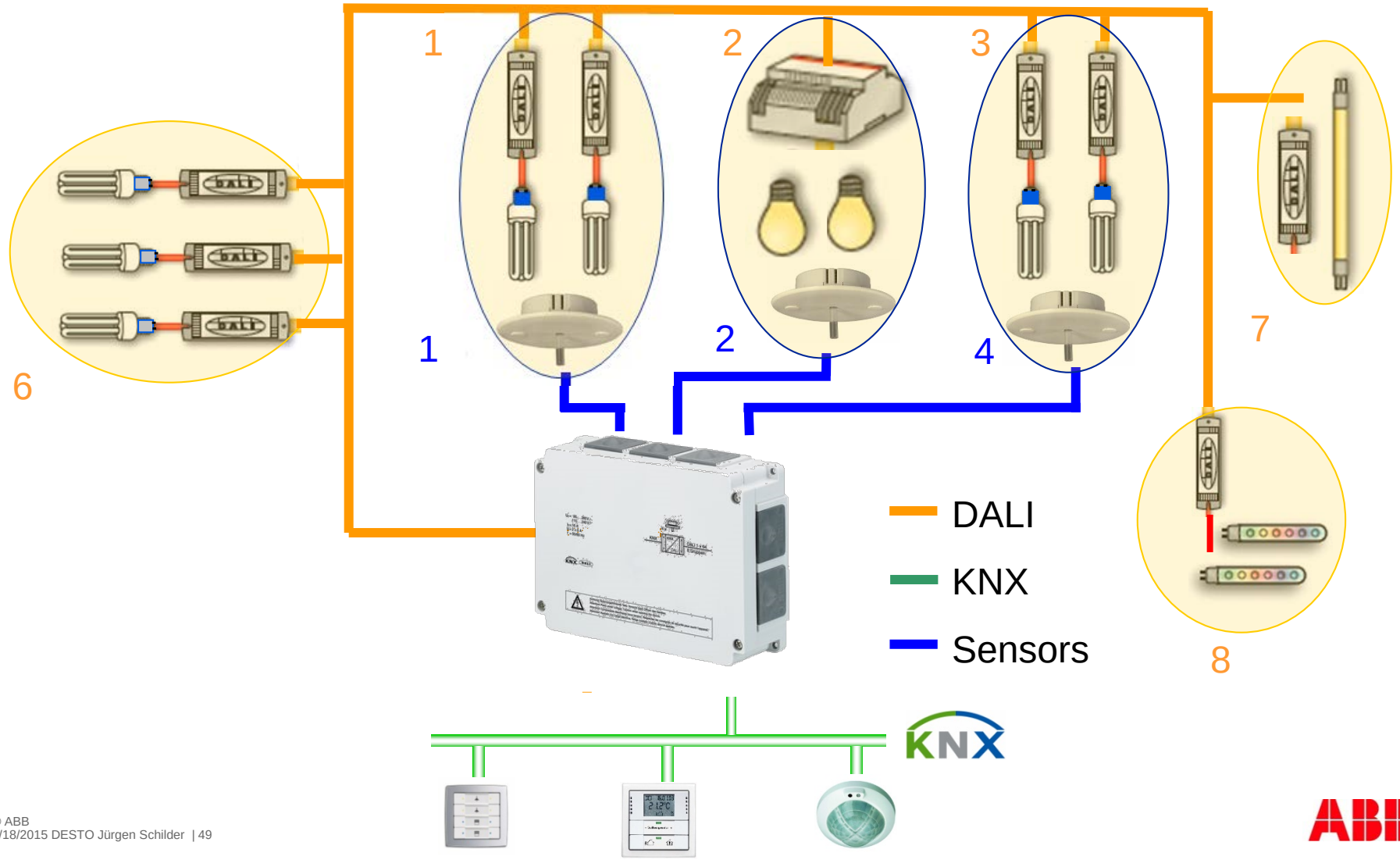


Webinar “Constant Light Control with KNX”
DALI Light Controller DLR/A 4.8.1.1

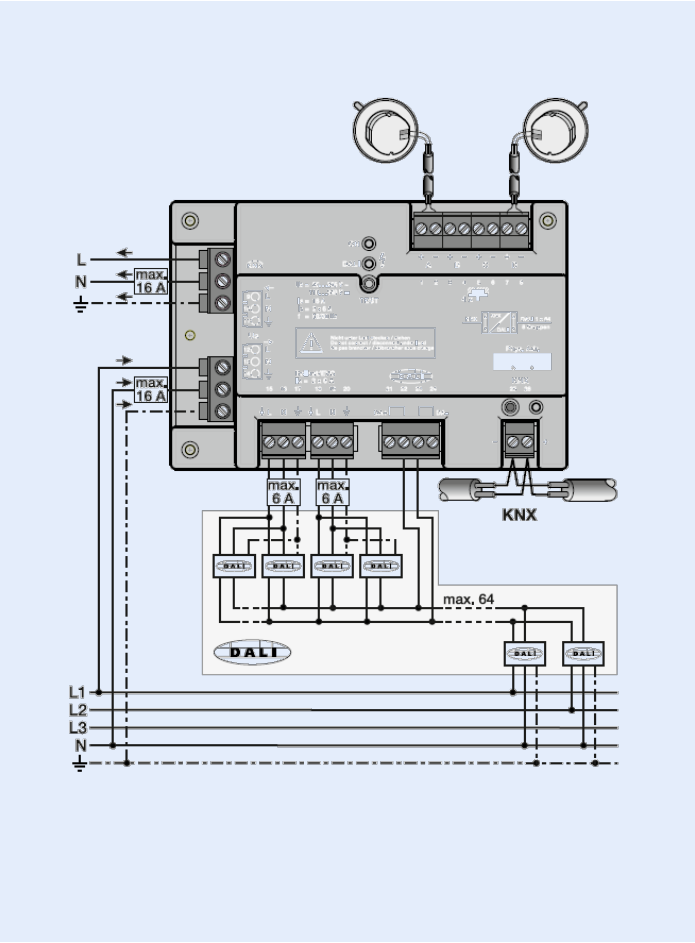


- 1 DALI control output for 64 devices
- 8 DALI groups, 4 groups for constant light control
- 4 sensor inputs for LF/U 2.1
- Surface mounting design
- 134 x 189 x 50 (H x W x D)
- Enclosure IP54
- Gateway operating voltage 110…240 V AC/DC Power supply
- Housing based on RC/A Room Controller
- Functionality and electronic layout based on DLR/S 8.16.1M

Webinar “Constant Light Control with KNX”
Connection Diagramm



Webinar “Constant Light Control with KNX”
Input and Output DLR/A 4.8.1.1

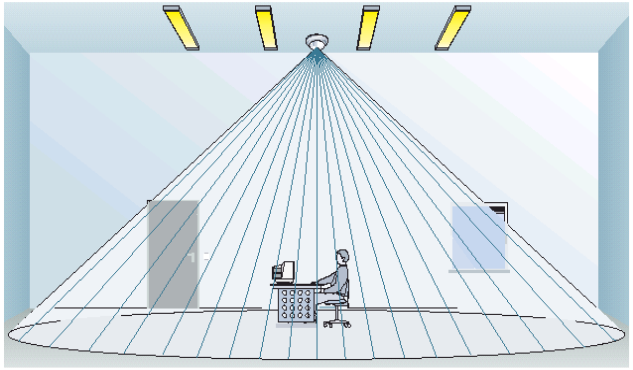


- 1 DALI output
- 1 KNX connection
- 4 Sensor inputs LF/U 2.1
- Gateway operating voltage (2 x terminals 16A)
- DALI Ballast operating voltage (2 x terminals 6A)

Webinar “Constant Light Control with KNX”
Tips and Tricks

- Lamps within one circuit to be controlled should have the same characteristic
- Open-plan office with one control circuit : 2 sensors in different locations of the room, control depending on average or minimum brightness value
- Option: Open-plan office with two or more independent control circuits possible, but interference has to be avoided
- Simple test of LF/U 2.1: In darkness 0 V, with brightness some 100 mV measurable
- Day light compensation factor practically among 30 and 50 (default 35)
- Dimming speed during regulation should be normally low (adjustable in ETS)
- Burn in process recommended for good control behaviour

Webinar “Constant Light Control with KNX”
Presence Detector 6131/11

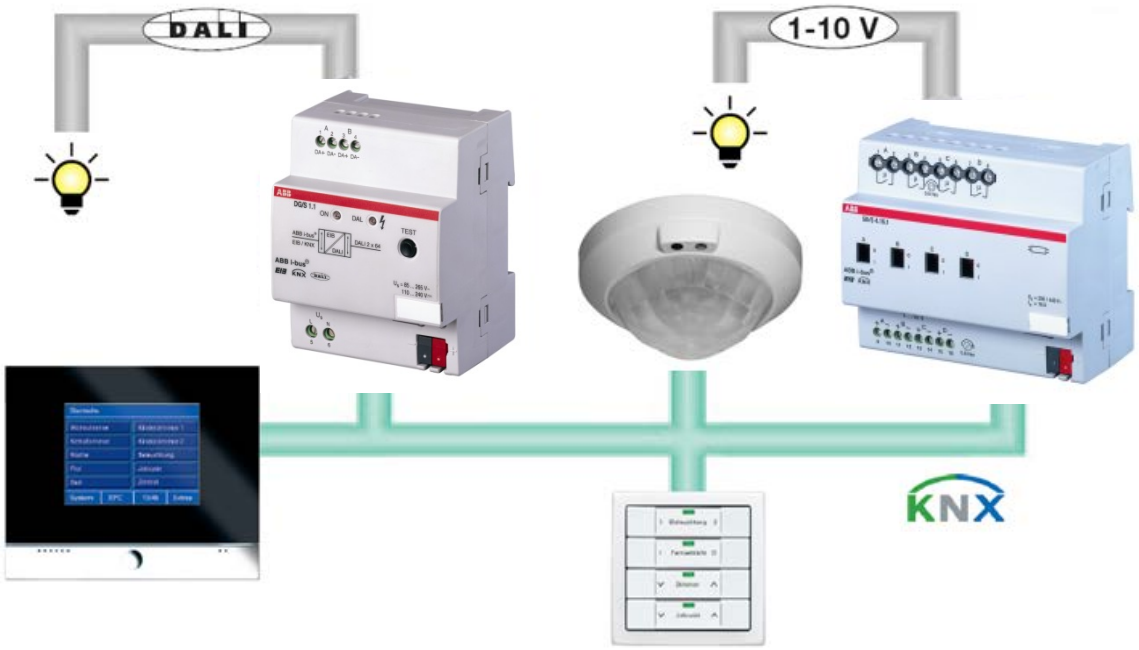


- Sensitive detection of movement
- Control of lighting and HVAC

- **Constant Light Control with integrated light sensor and application with controller functionality**

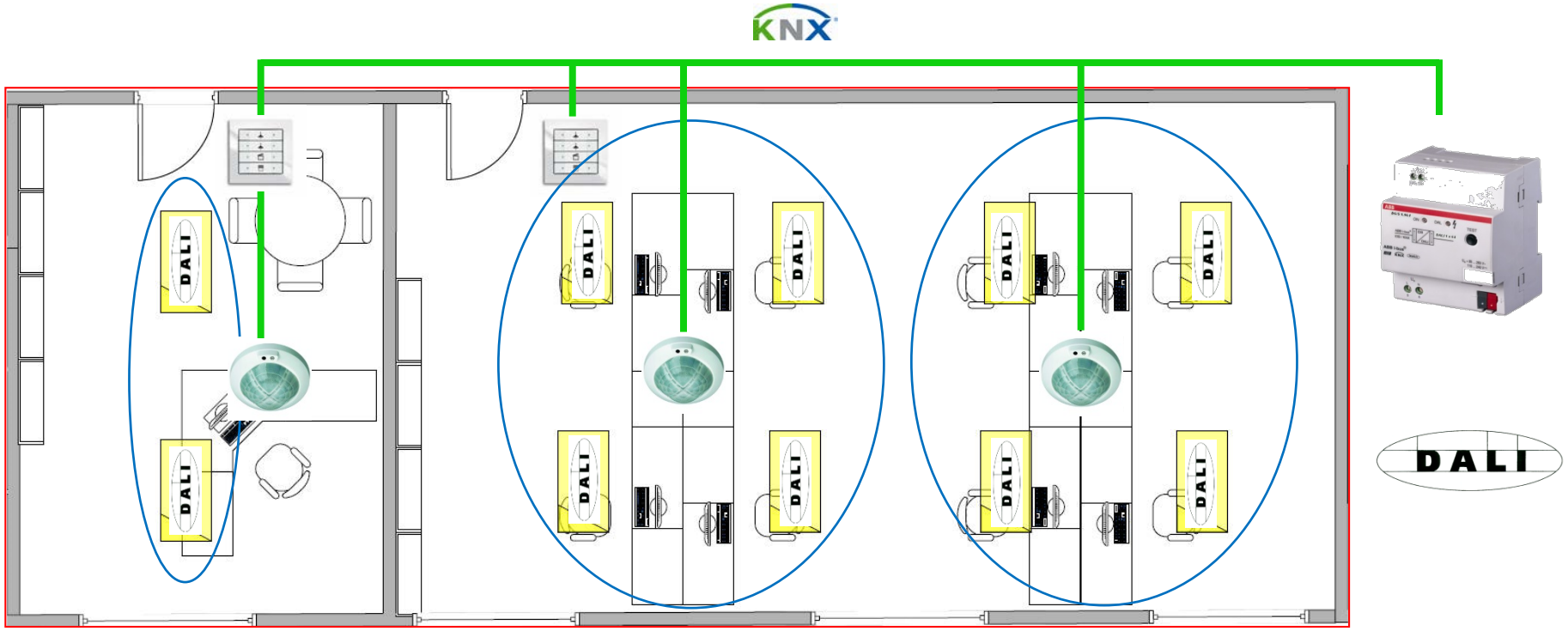
Webinar “Constant Light Control with KNX”
Presence Detector 6131/11

- Presence detector 6131/11 in conjunction with 1-10 V dimmer (e.g. SD/S 4.16.1) or DALI Gateway (e.g. DG/S 1.1)

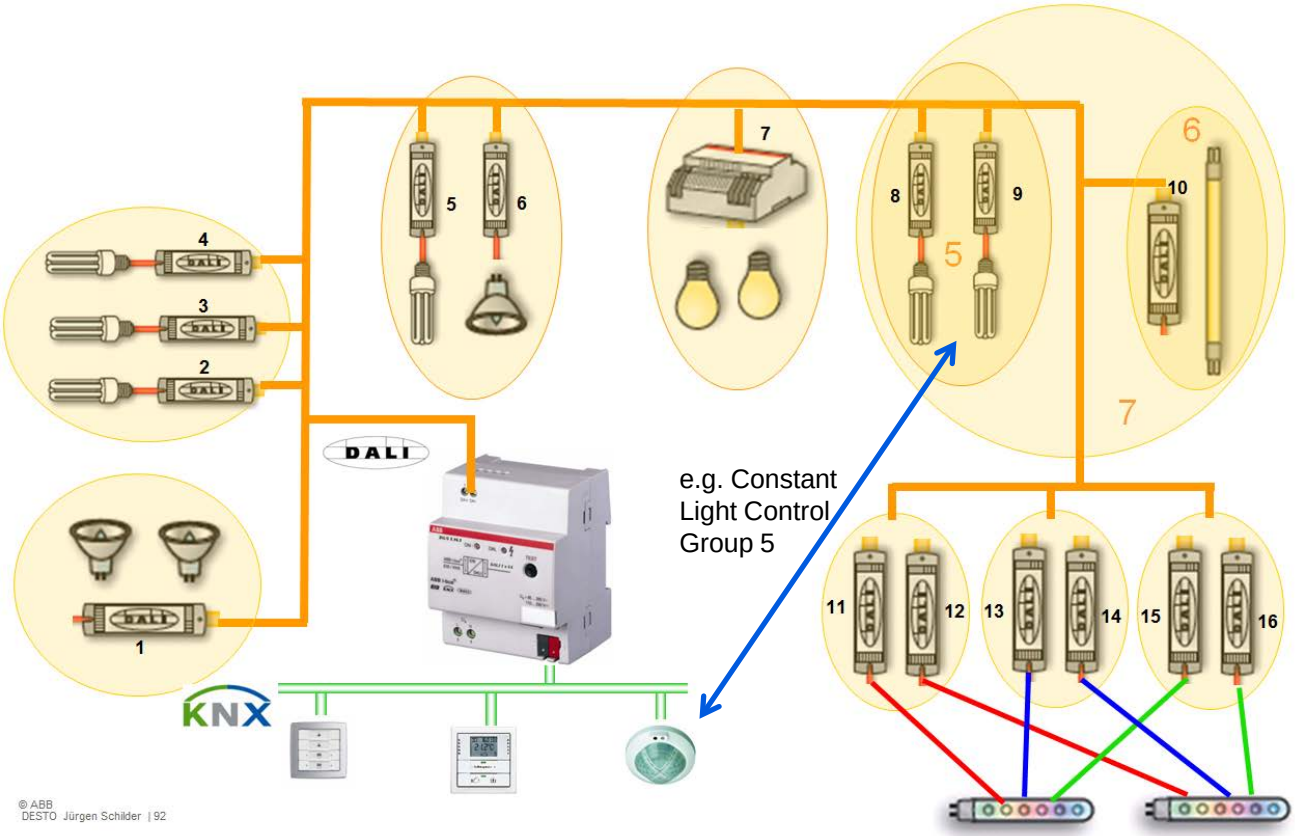


Webinar “Constant Light Control with KNX”
Constant Light Control, Presence Detector, DALI

- Presence Detector 6131/11 and DG/S 1.16.1



Webinar “Constant Light Control with KNX”
Principle



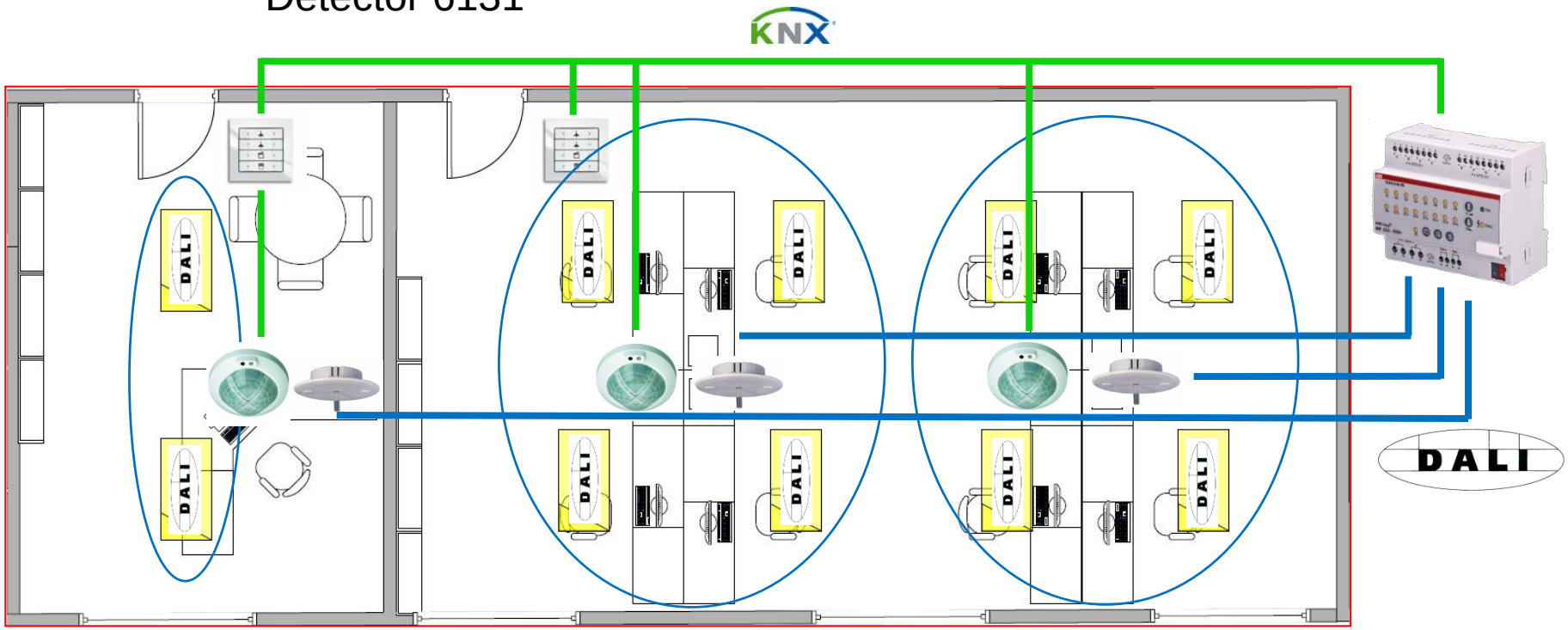
Webinar “Constant Light Control with KNX”
Comparision



	LF/U 2.1	6131/11
Calibration with i-bus tool	✓	-
Mounting independent of presence detector	✓	-
Special Parameters (e.g. control dynamic parameters, Priority, …)	✓	-
Additional functions (Logic, Time, …)	-	✓
Integrated presence detector	-	✓
Measurement of brightness adapt-able via two different glas rods	✓	-
IR Communication	-	✓
Accuracy	++	+
Costs (when presence detector required)	+	++
No KNX bus traffic for regulation	✓	-

Webinar “Constant Light Control with KNX”
Principle

- Light Sensor LF/U 2.1 with DLR/S 8.16.1M, Presence Detector 6131



Webinar “Constant Light Control with KNX”
Commissioning - calibration process

The following work must be carried out:

HINT: Room has to be set up completely ! (Furniture, Painting …)

1. Programming of the individual address (ETS), enable additional function “Light controller” (group 1) and download application
2. Optional readdressing of the DALI addresses and assignment of DALI-devices to DALI-groups (i-bus Tool or DGS Software Tool)
3. Calibration process (i-bus Tool or manual via ETS)
   - Artificial light calibration
   - Daylight calibration
4. Parameterisation of the ETS application
5. Assignment of group addresses to the communication objects

   …

Webinar “Constant Light Control with KNX”
Commissioning - calibration process

The following work must be carried out:

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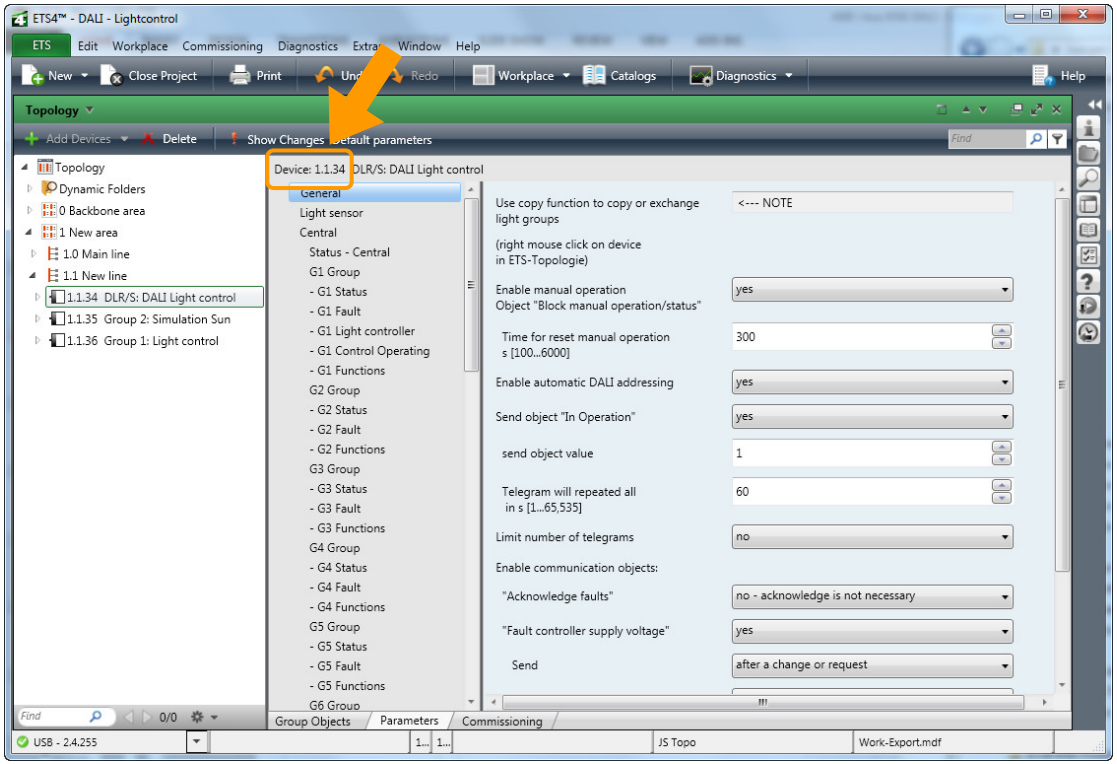

Webinar “Constant Light Control with KNX”
Commissioning - calibration process

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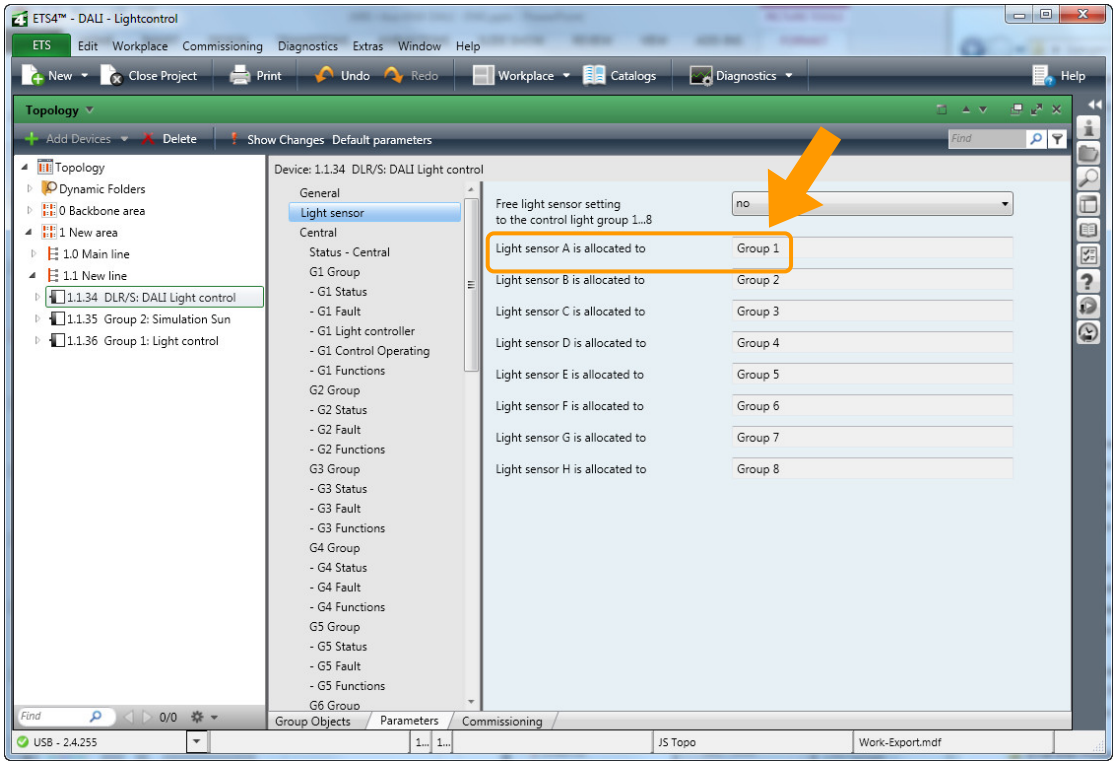

Webinar “Constant Light Control with KNX”
Commissioning - calibration process

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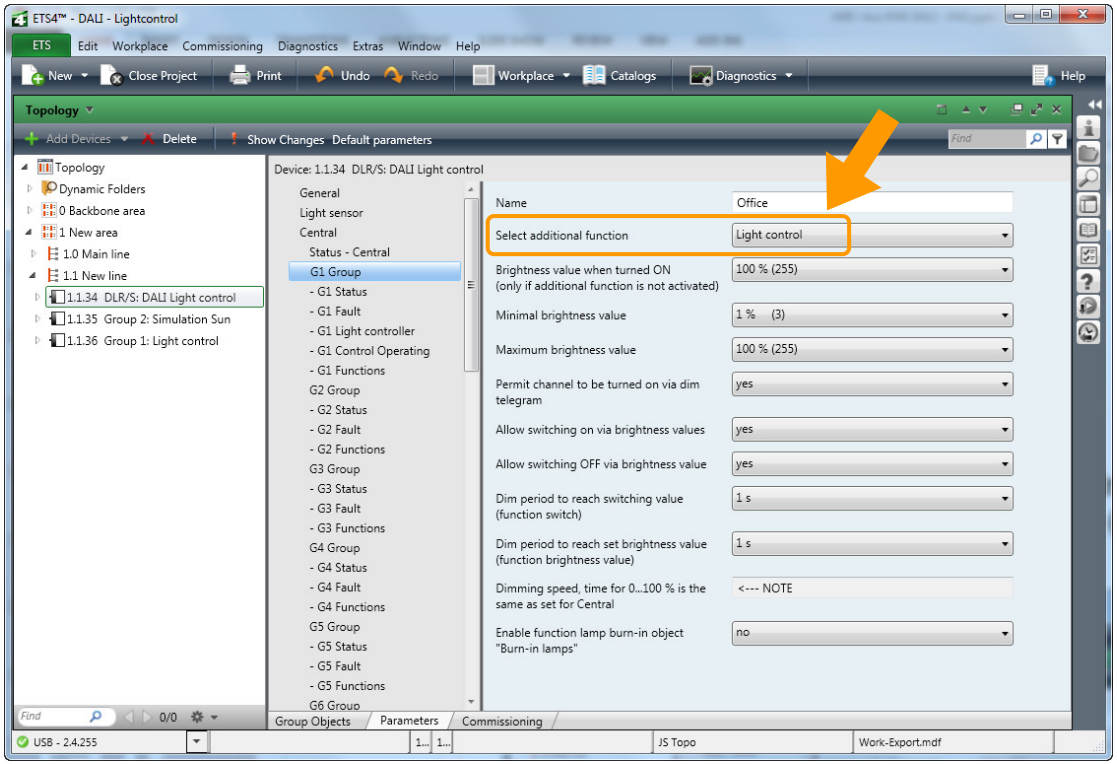
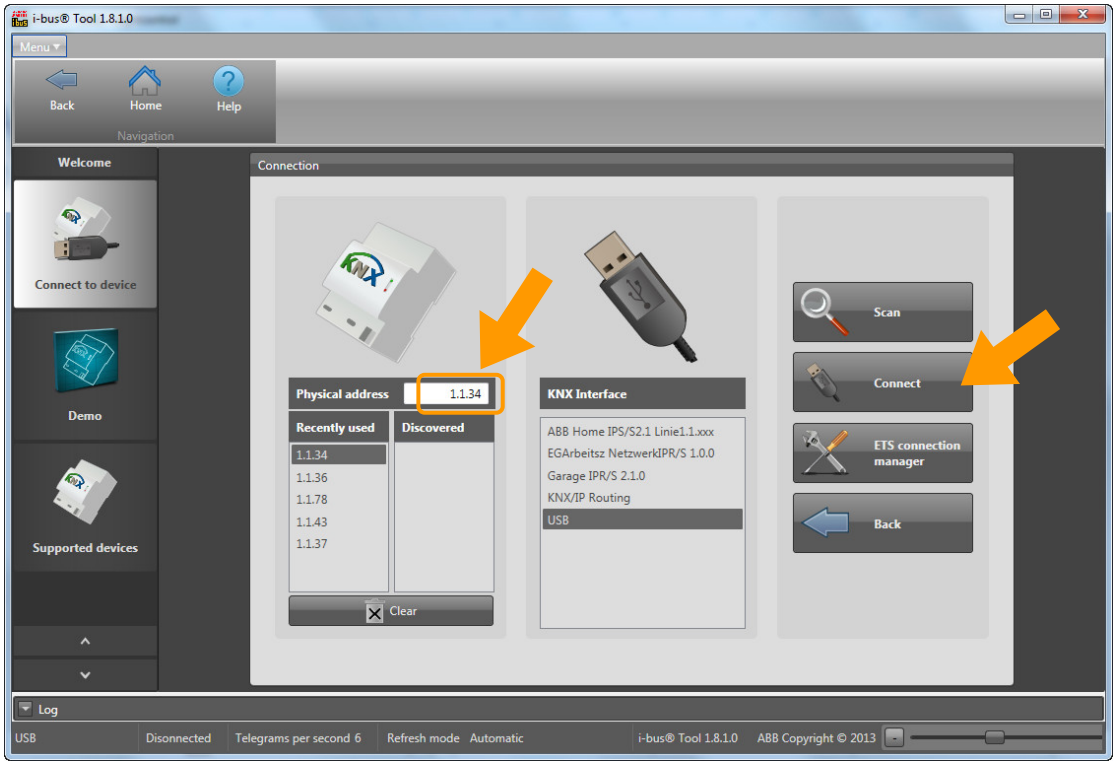


Webinar “Constant Light Control with KNX”
Commissioning - calibration process

The following work must be carried out:

2. Optional readdressing of the DALI addresses and assignment of DALI-devices to DALI-groups (i-bus Tool or DGS Software Tool)



Webinar “Constant Light Control with KNX”
Commissioning - calibration process

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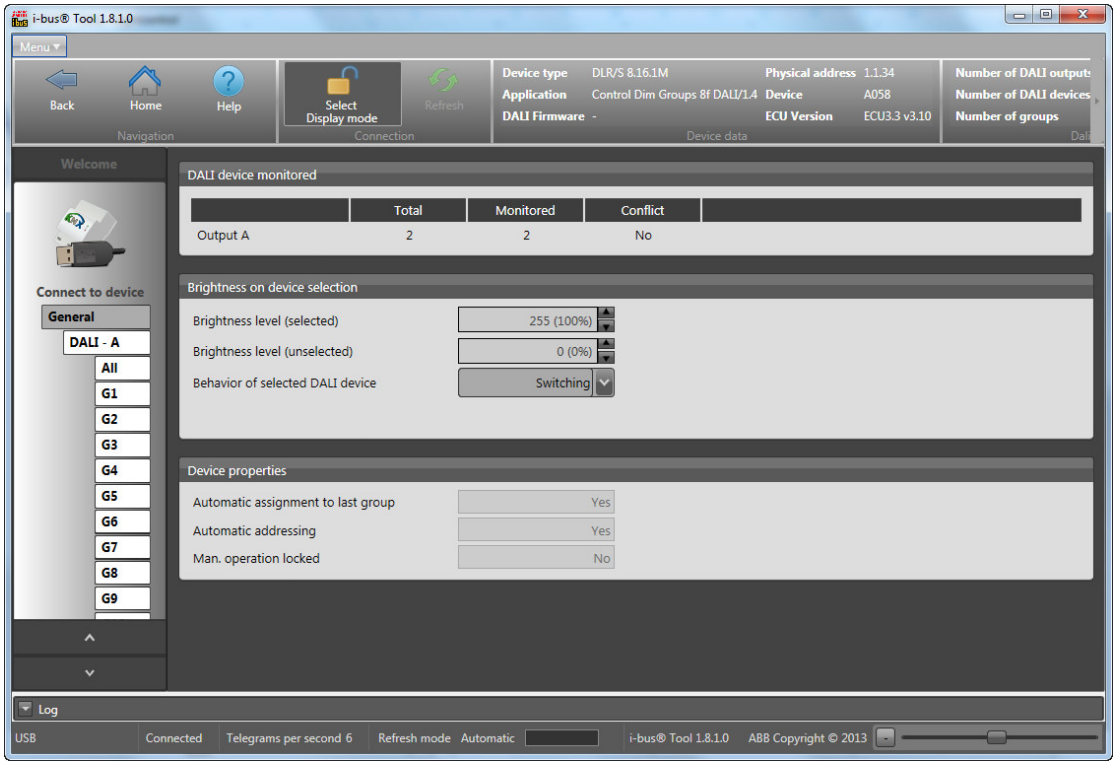

Webinar “Constant Light Control with KNX”
Commissioning - calibration process

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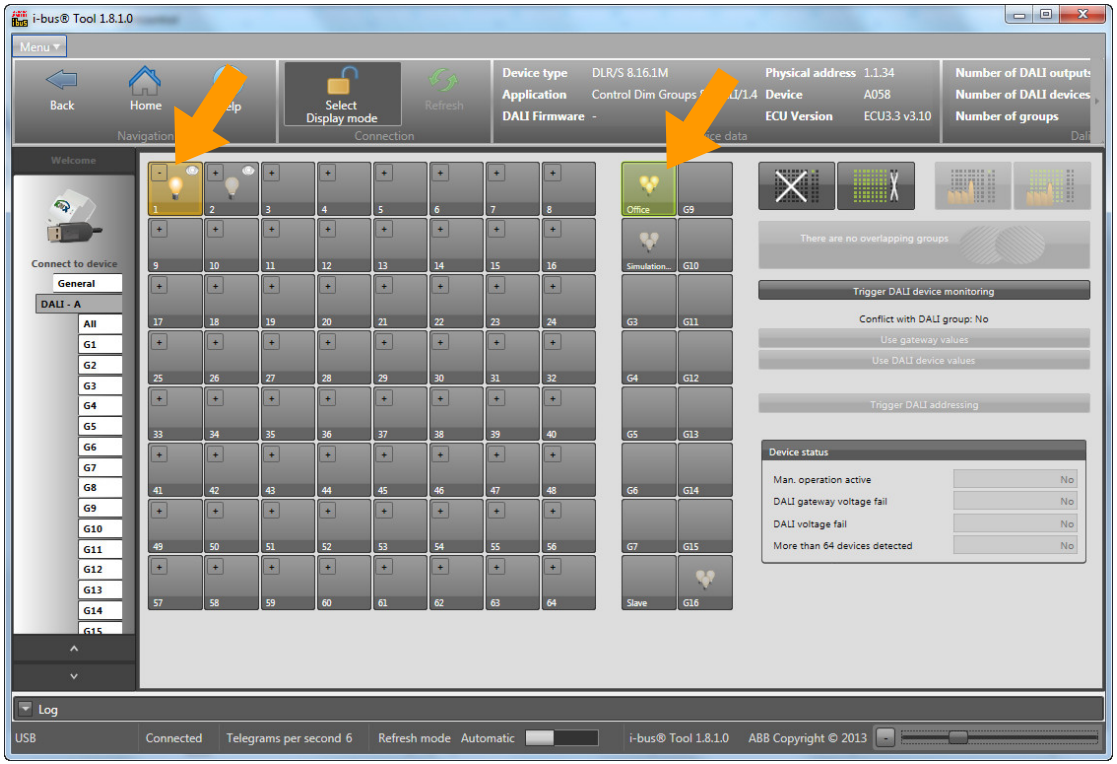
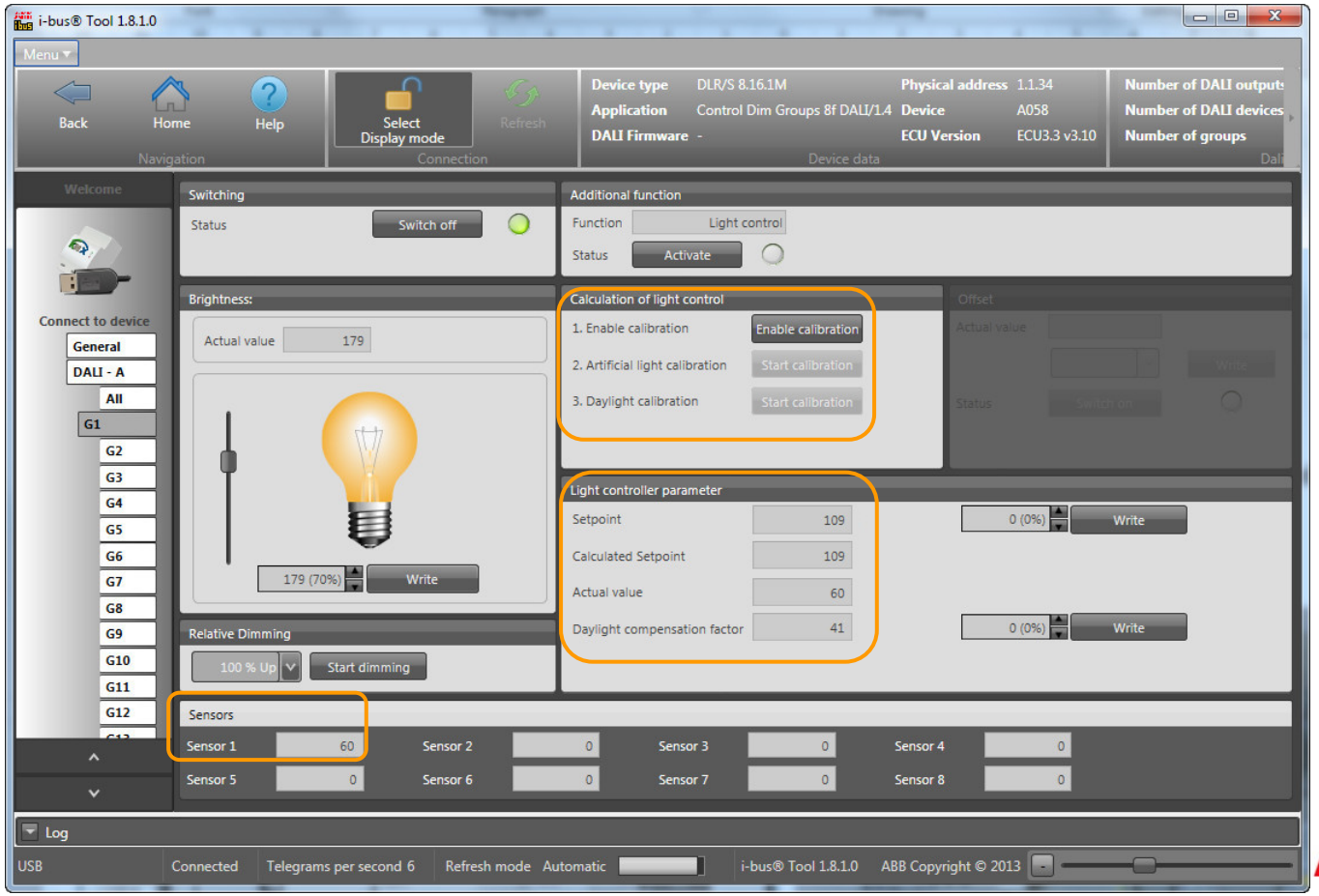


Webinar “Constant Light Control with KNX”
Commissioning - calibration process

The following work must be carried out:

3. Calibration process (i-bus Tool)



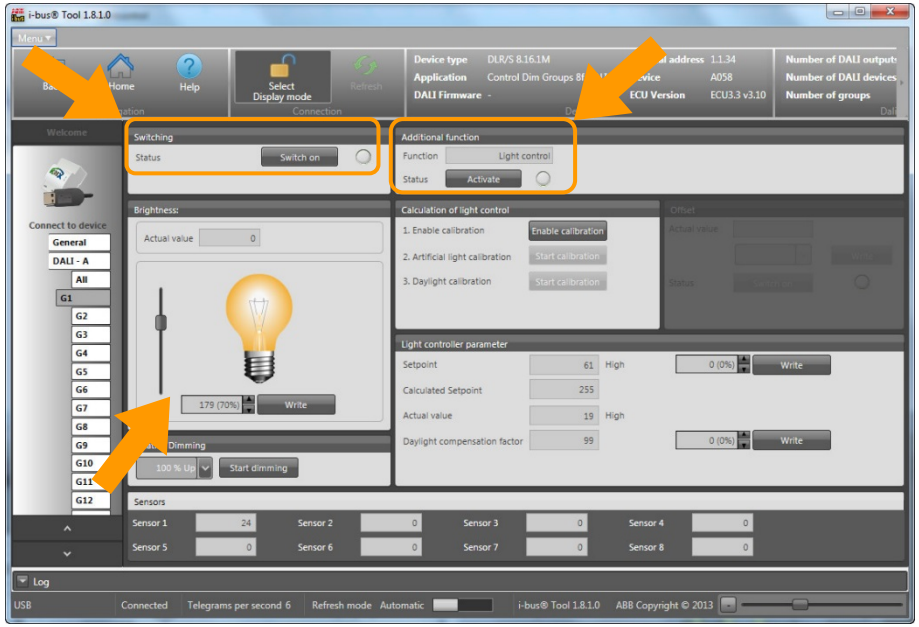
Webinar “Constant Light Control with KNX”
Commissioning - calibration process

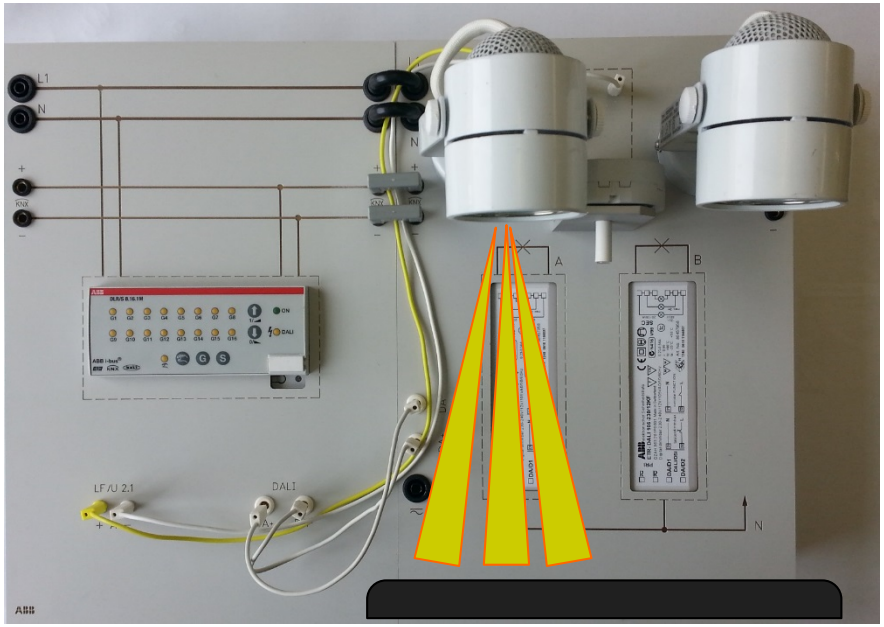
The following work must be carried out:

3. Calibration process (i-bus Tool)

   Deactivate Light Control (button “Deactivate”)

   Test group 1 (switch on/off, send values, …)





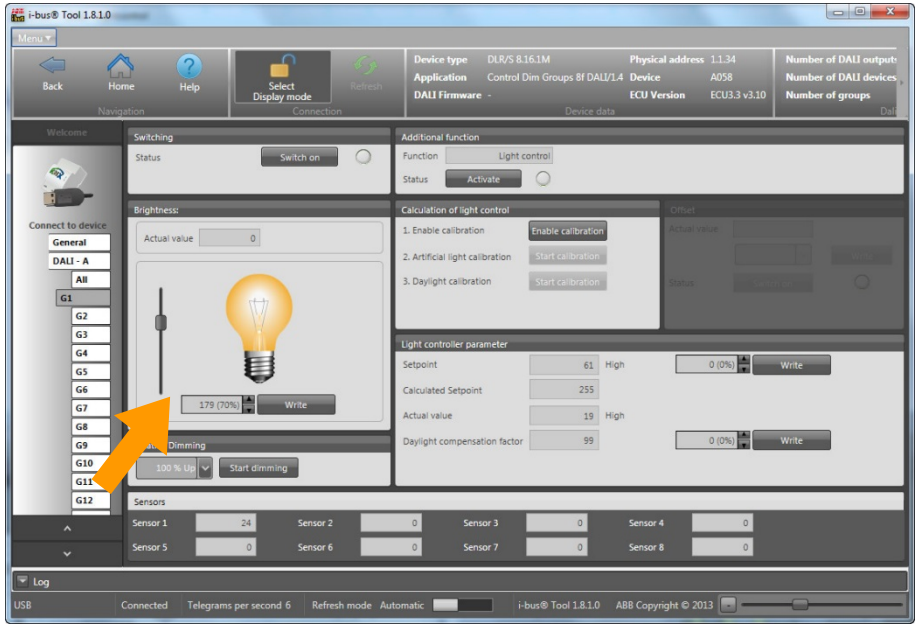
Webinar “Constant Light Control with KNX”
Commissioning - calibration process

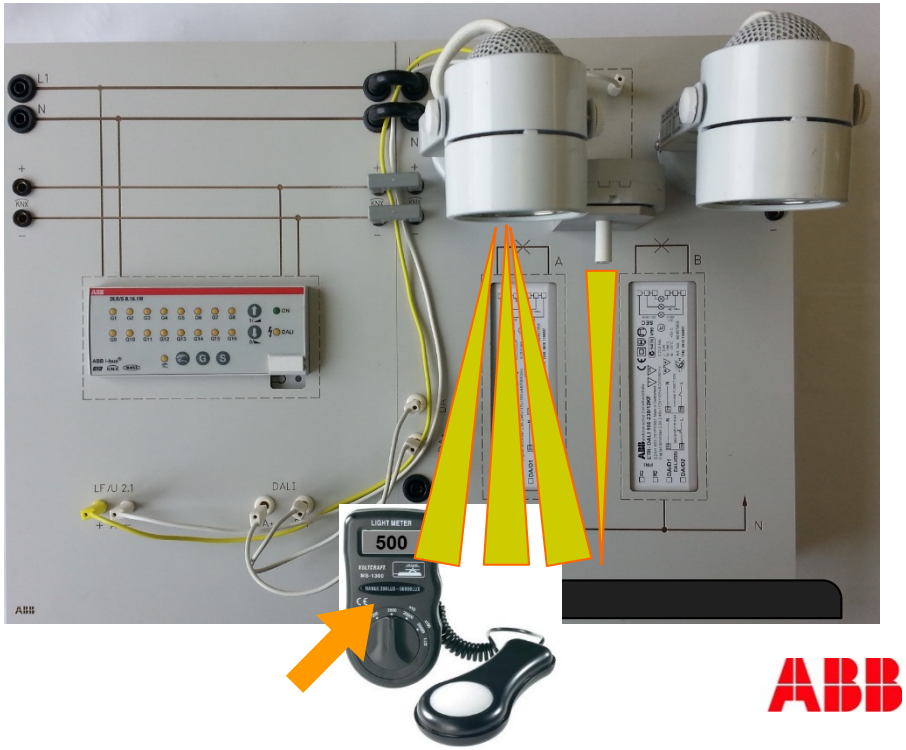
The following work must be carried out:

3. Calibration process (artificial light calibration)

   Darken the room (darkness or blinds down) → room has less than 20 lux

   Dim room lighting to the required brightness (e.g. 500 lux) via slider “Brightness Value” → room has correct brightness (to be measured with lux meter)





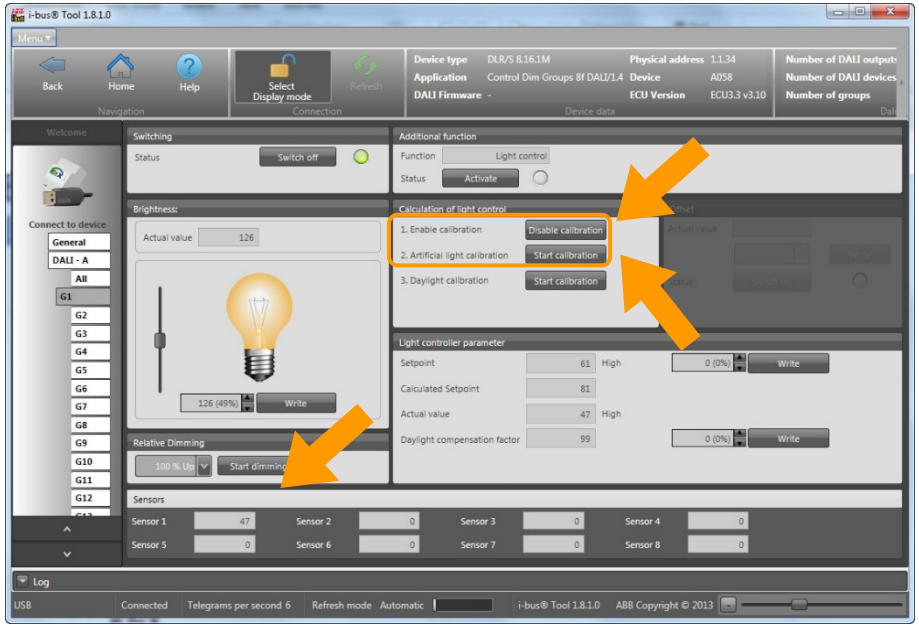
Webinar “Constant Light Control with KNX”
Commissioning - calibration process

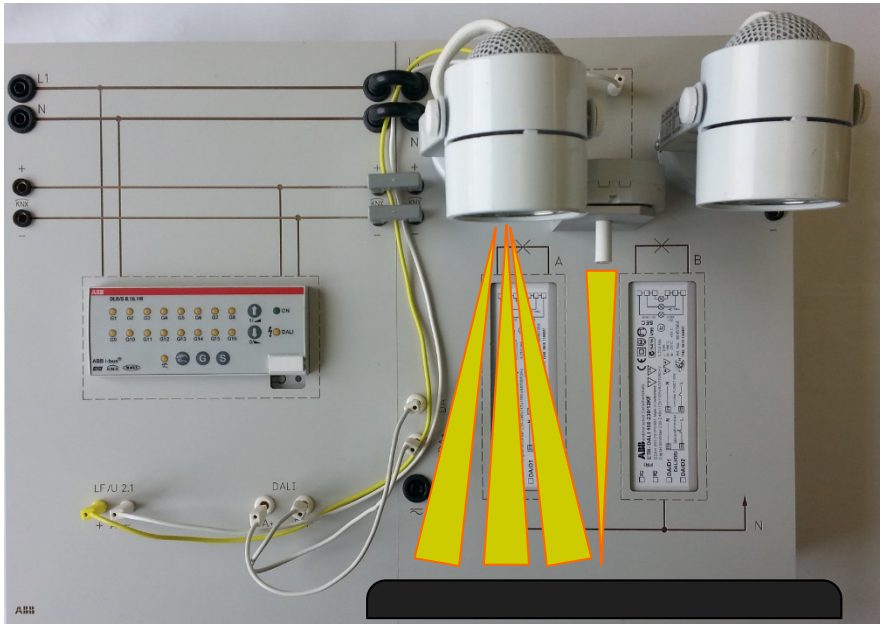
The following work must be carried out:

3. Calibration process (artificial light calibration)

   Enable calibration (button “Enable calibration”)

   Enable **artificial light calibration** (button “Start calibration”)
   Light on 100 % → dims slowly down to 0% (approx. 90 sec.)





Webinar “Constant Light Control with KNX”
Commissioning - calibration process

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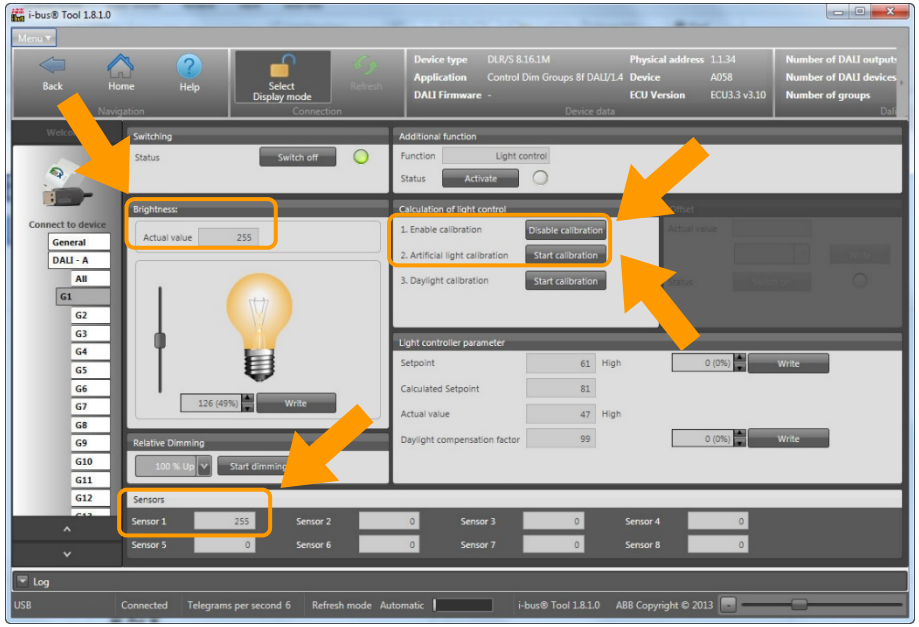
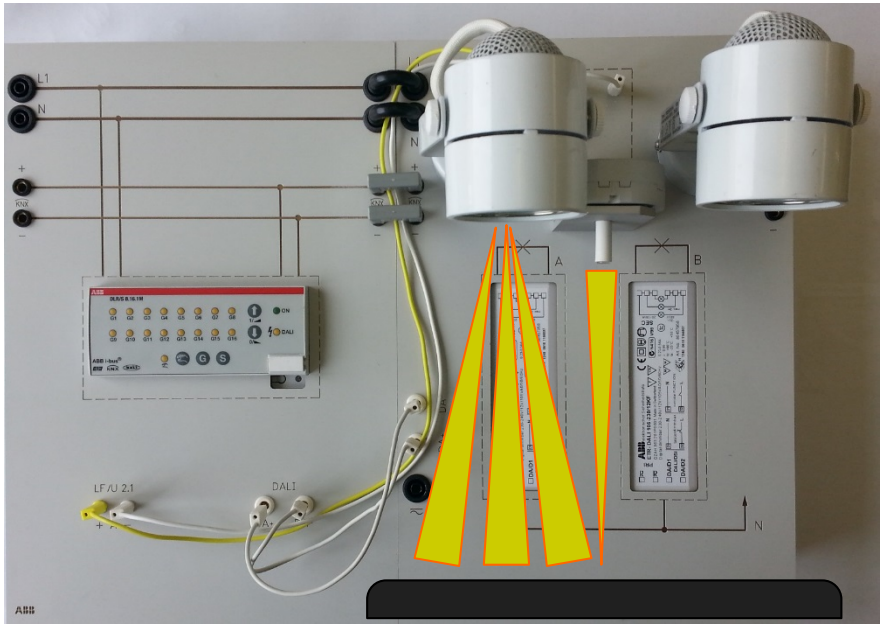


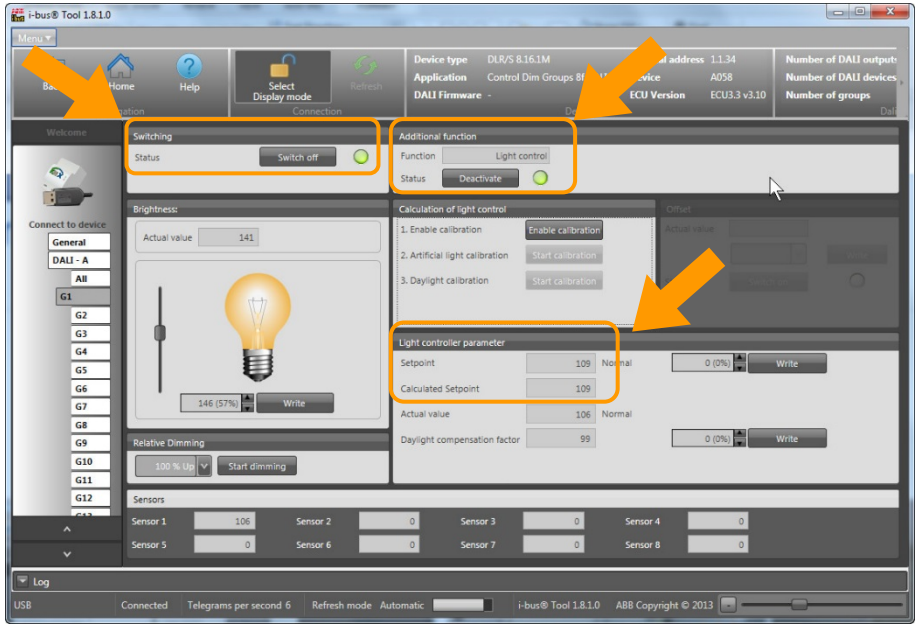


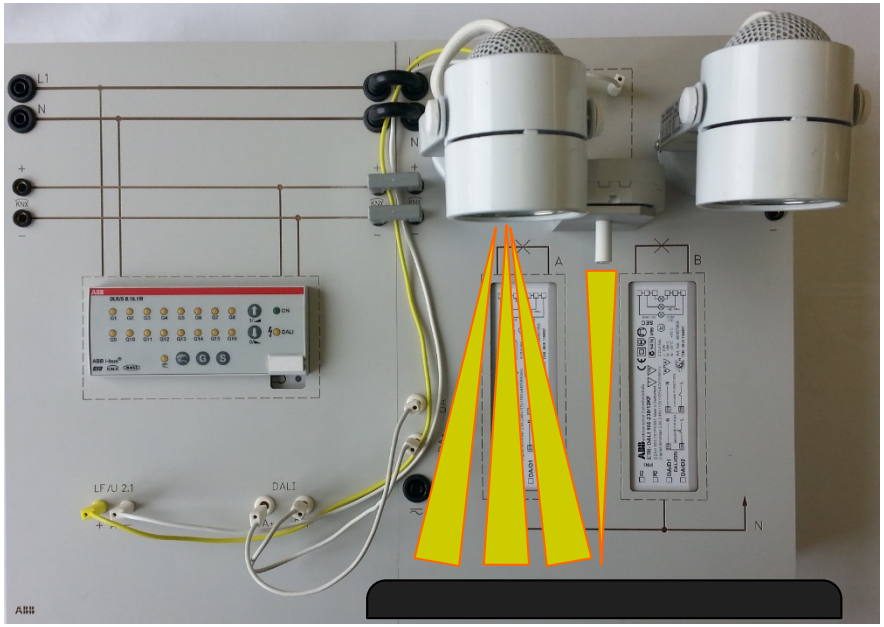
Webinar “Constant Light Control with KNX”
Commissioning - calibration process

The following work must be carried out:

3. Calibration process (artificial light calibration)

   Artificial light calibration ends → switches on and activate light control





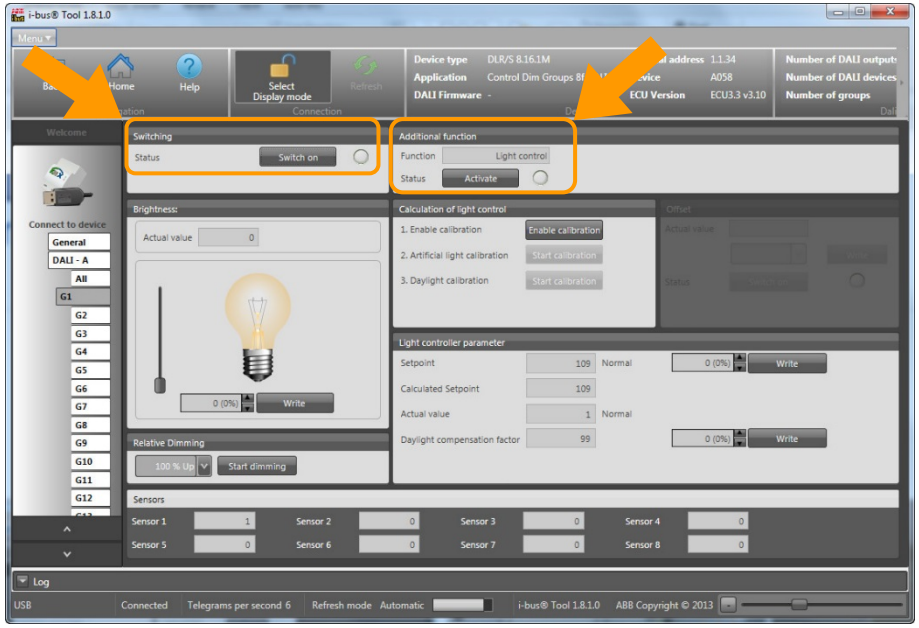
Webinar “Constant Light Control with KNX”
Commissioning - calibration process

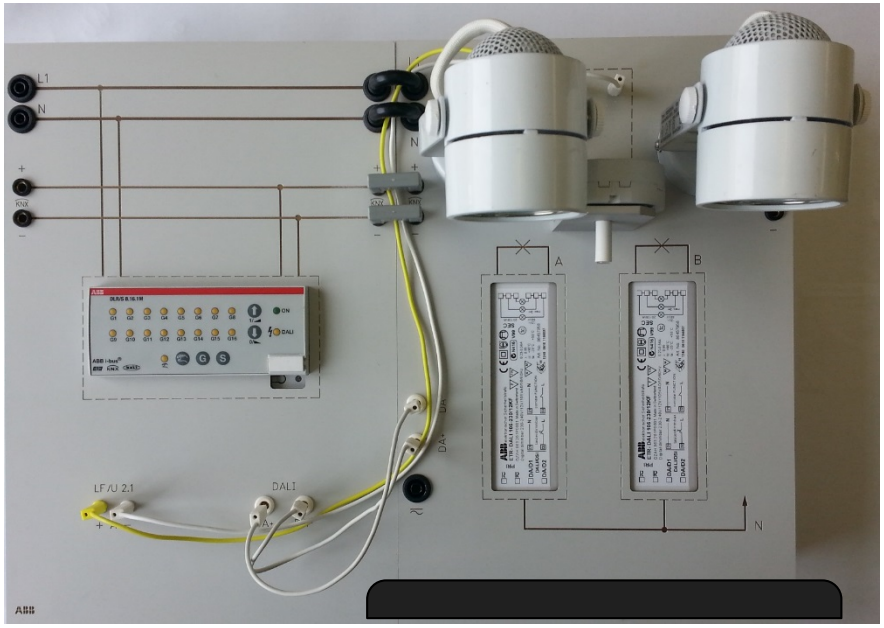
The following work must be carried out:

3. Calibration process (daylight calibration)

   Deactivate Light Control (button “Deactivate”)

   Switch off artificial light (button group 1 “Switch off”)





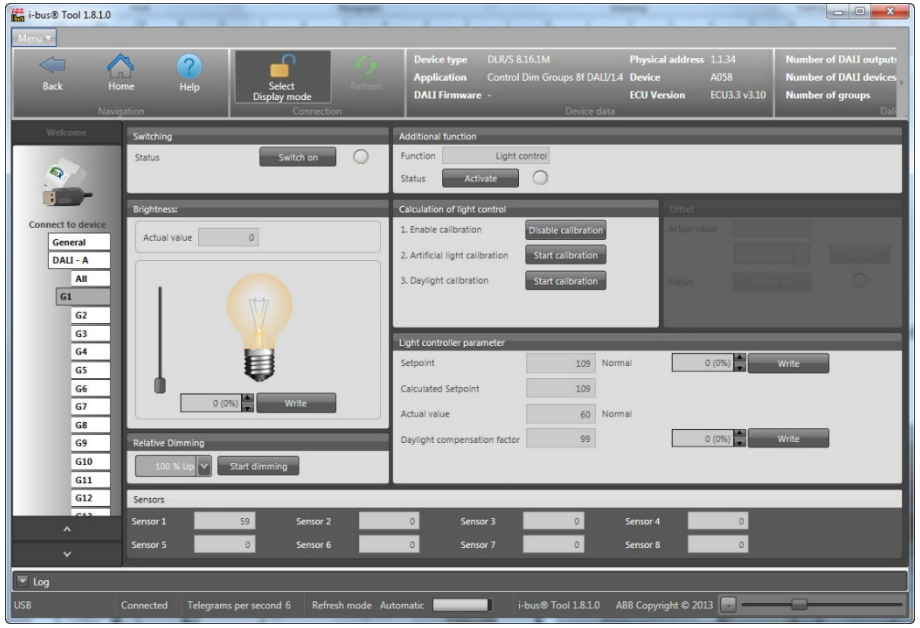
Webinar “Constant Light Control with KNX”
Commissioning - calibration process

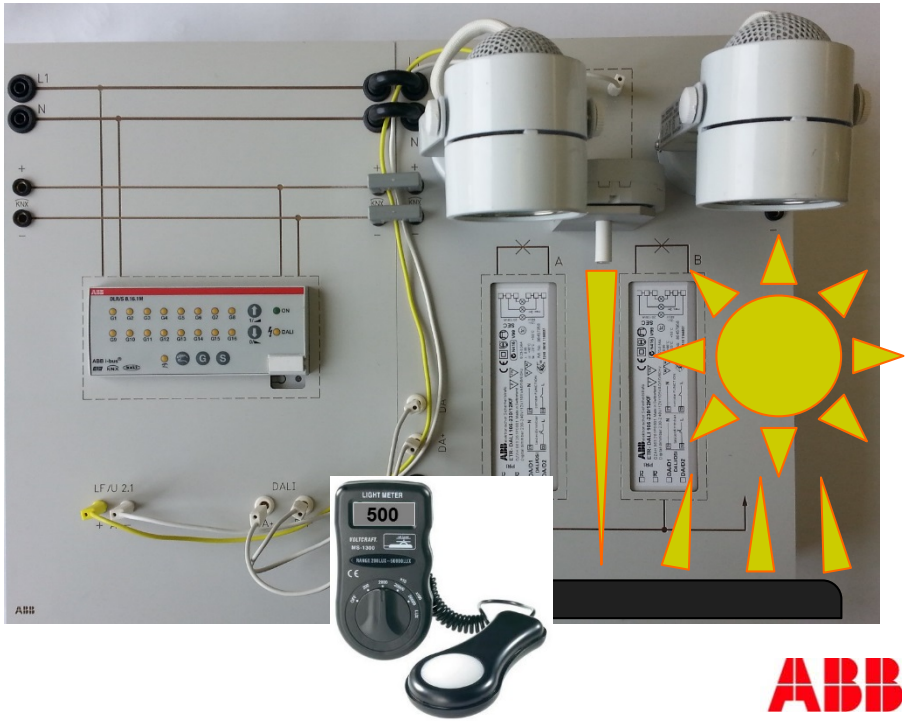
The following work must be carried out:

3. Calibration process (daylight calibration)

   Set the same setpoint brightness (e.g. 500 lx) like artificial light calibration with daylight. The setpoint can be set by driving blinds or time of day.

   Training: Use group 2 for simulation sun (slider group 2 “Brightness Value”)





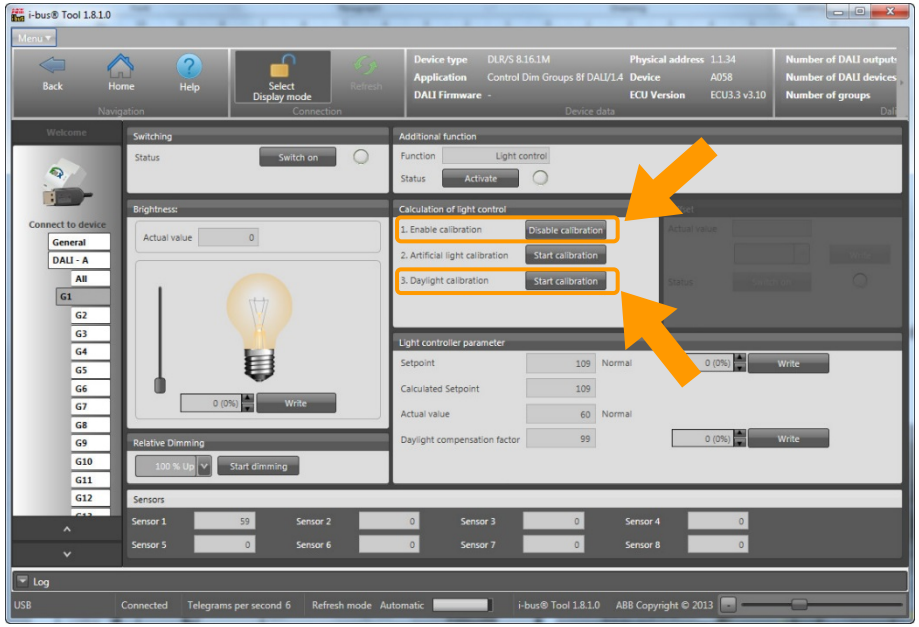
Webinar “Constant Light Control with KNX”
Commissioning - calibration process

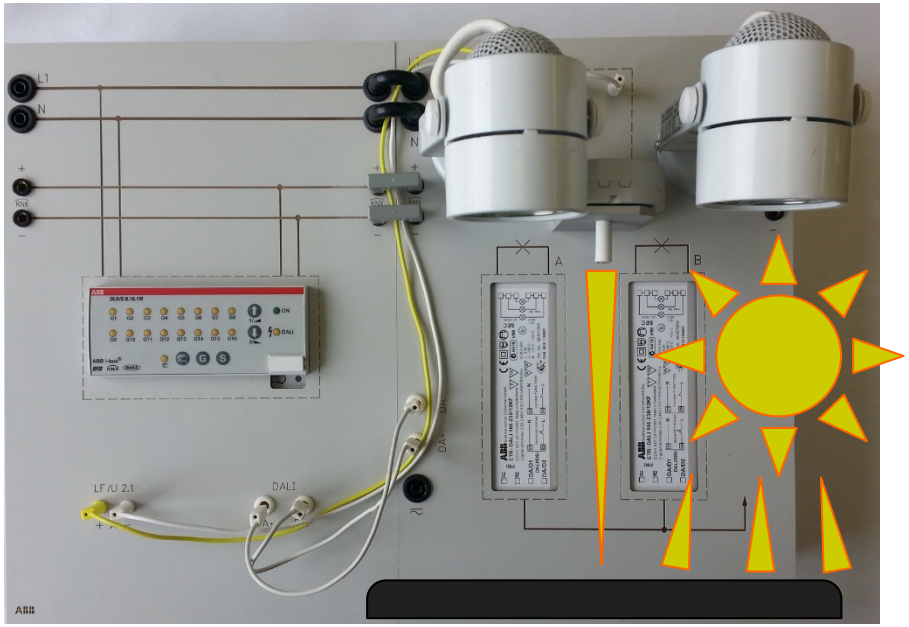
The following work must be carried out:

3. Calibration process (daylight calibration)

   Enable calibration (button “Enable calibration”)

   Enable **daylight calibration** (button “Start calibration”) → Light controller commences daylight calibration





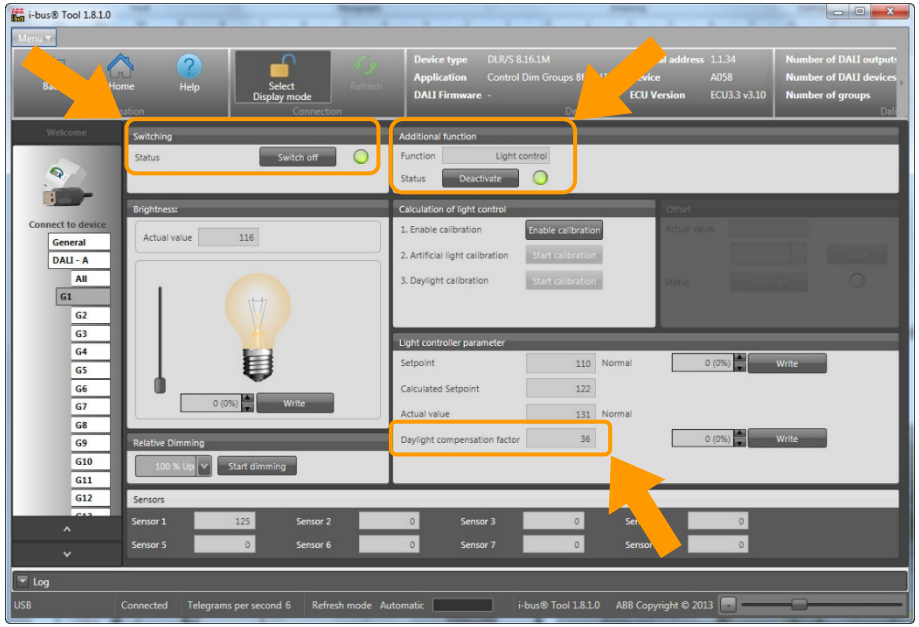
Webinar “Constant Light Control with KNX”
Commissioning - calibration process

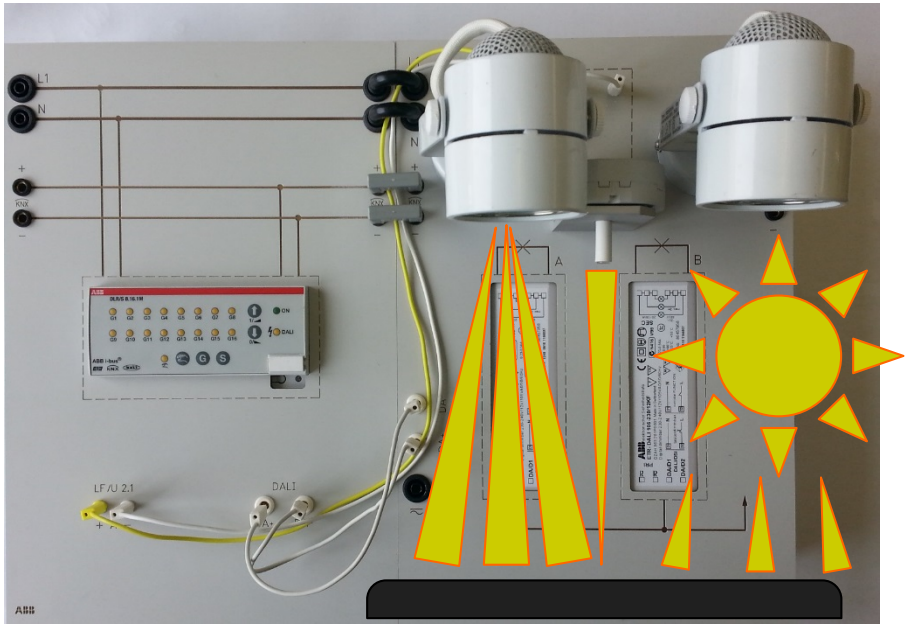
The following work must be carried out:

3. Calibration process (daylight calibration)

   Calibration has ended after about 5 seconds and the daylight compensation factor is calculated → defines the relationship between daylight and artificial lighting

   End of **daylight calibration** → Light control active and controlling





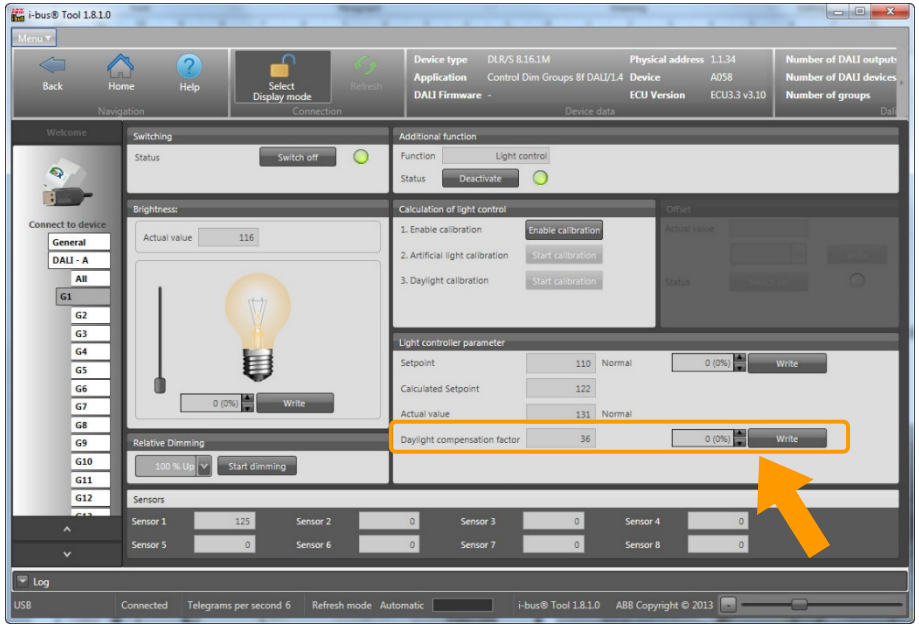
Webinar “Constant Light Control with KNX”
Commissioning - calibration process

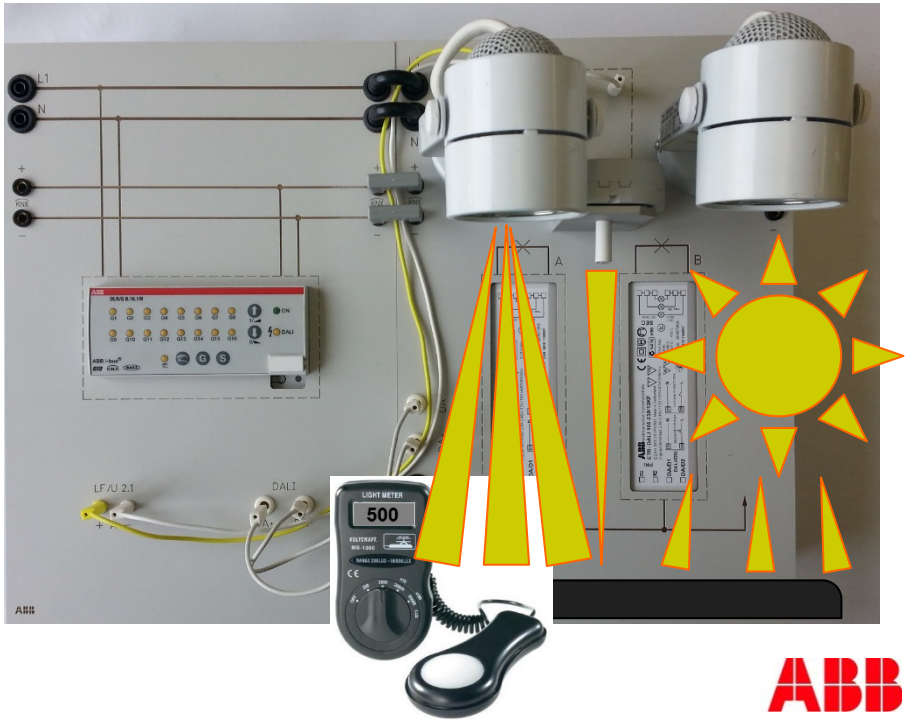
The following work must be carried out:

3. Calibration process (manual calibration)

   If no daylight calibration is possible (e.g. no blinds) the daylight compensation factor must be calculated manually

   A factor between 0 and 99 can be entered (a factor of between 30 and 50 generally provides the best results in most cases)





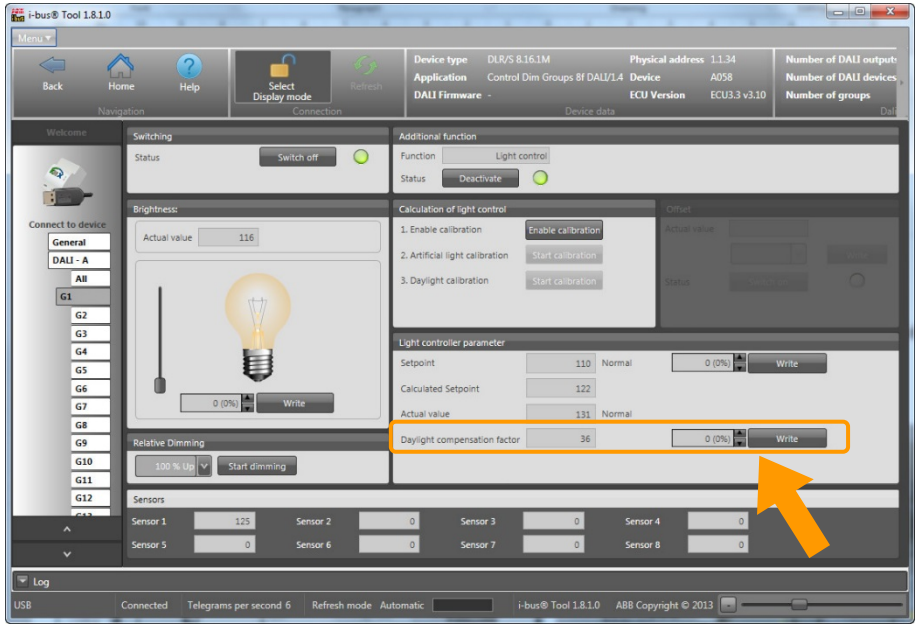
Webinar “Constant Light Control with KNX”
Commissioning - calibration process

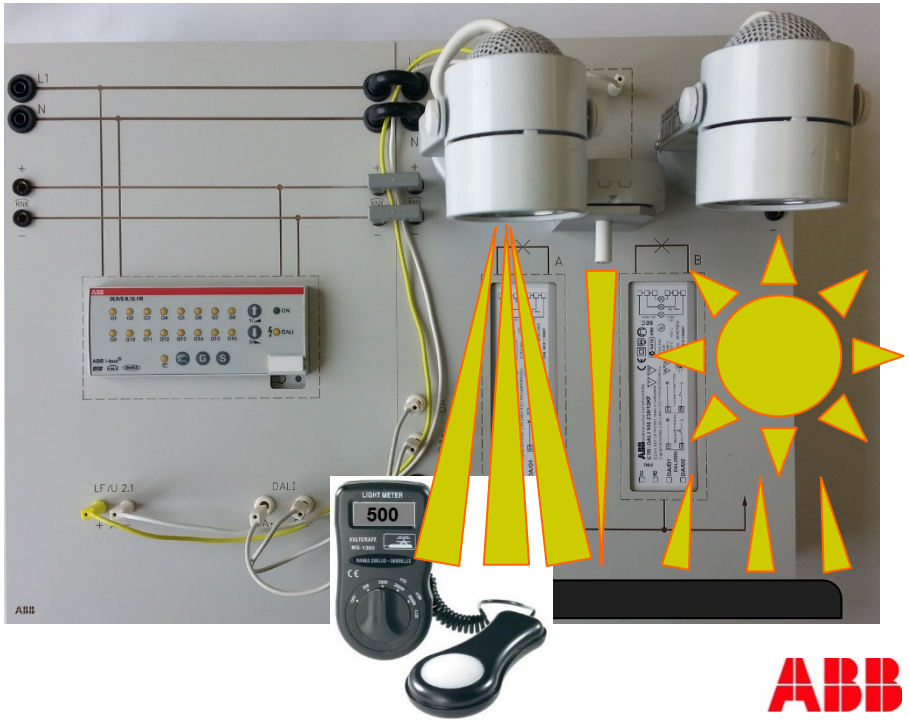
The following work must be carried out:

3. Calibration process (manual calibration)

   A larger value compensates more for daylight. A smaller value on the other hand gives a higher weighting to artificial lighting

   The lighting control has to be compared using the brightness measured in the detection range of the light controller by the lux meter





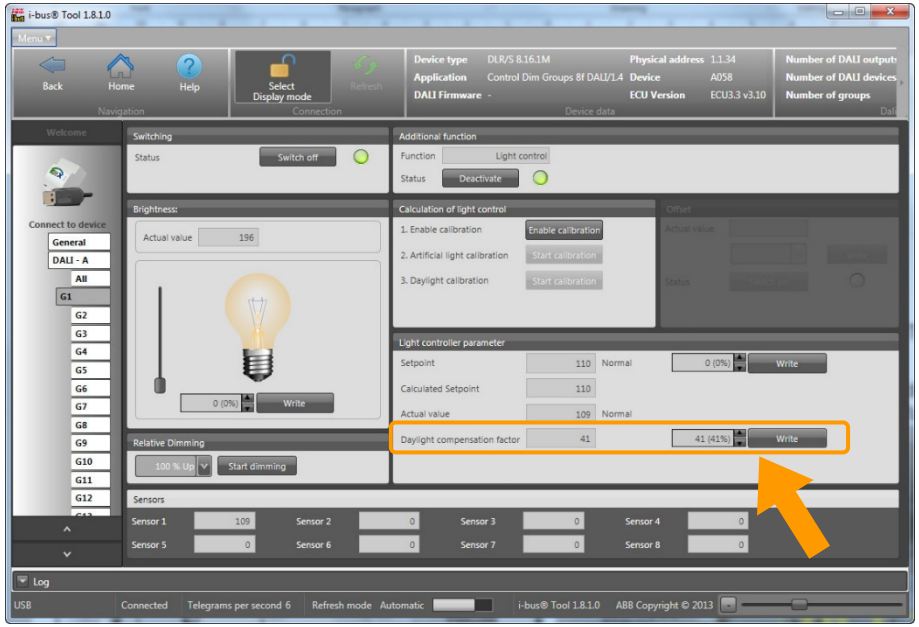
Webinar “Constant Light Control with KNX”
Commissioning - calibration process

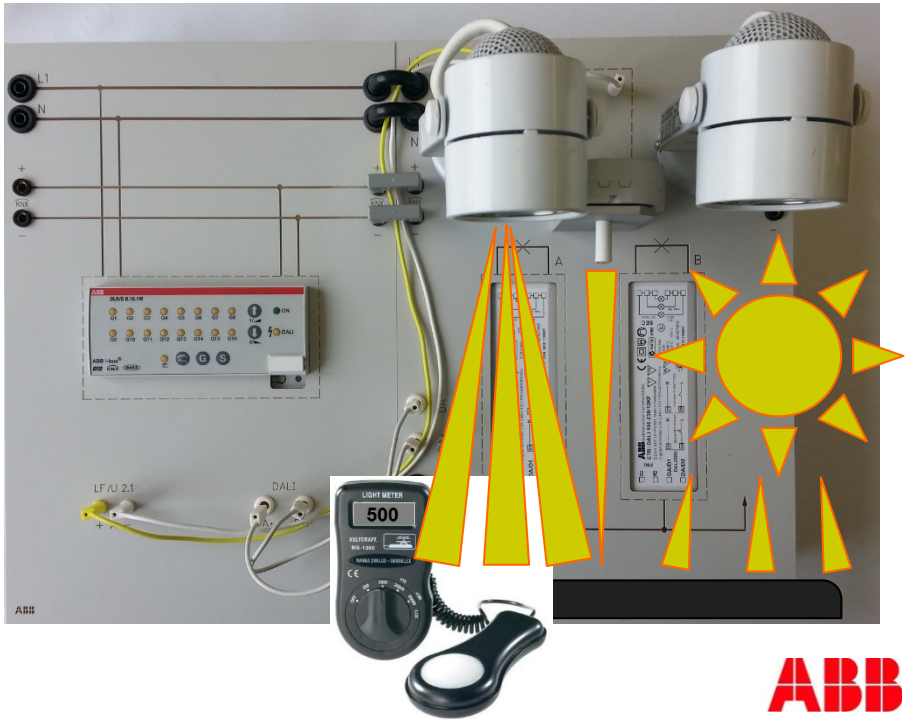
The following work must be carried out:

3. Calibration process (manual calibration)

   If the required setpoint is still too low, more artificial lighting is still required. This is achieved by increasing the factor.

   Too much artificial lighting is provided should the desired setpoint be exceeded. A reduction of the artificial lighting can be achieved by a reduction of the compensation factor.





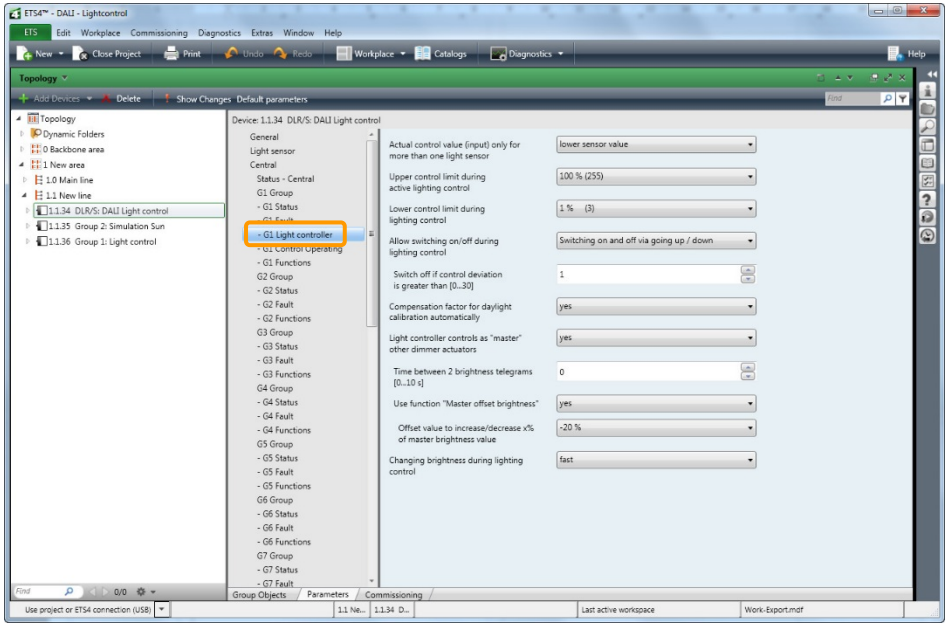
Webinar “Constant Light Control with KNX”
Commissioning - calibration process

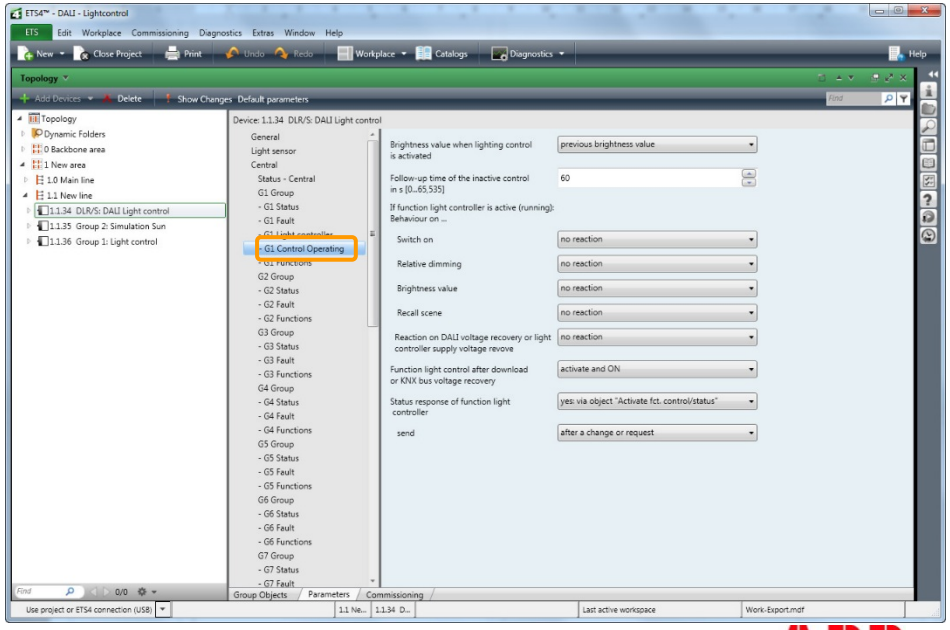
The following work must be carried out:

4. Parameterisation of the ETS application

   Status response, faults, burn-in time, staircase lighting, …

   Light controller: Allow switching on/off during lighting control, light controller controls as "master" other dimmer actuators, changing brightness, behaviour on relative dimming, brightness value or recall a scene, …

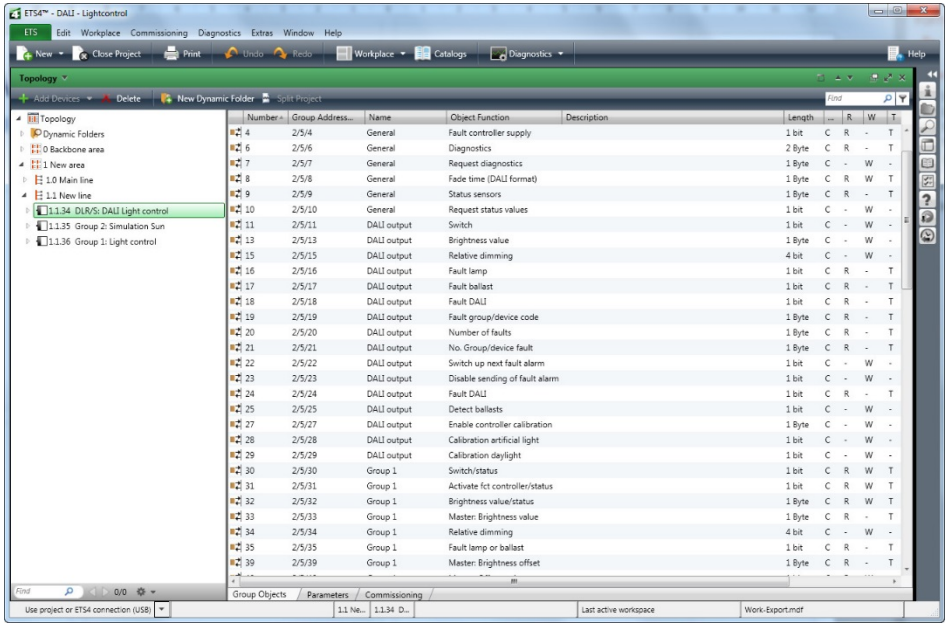




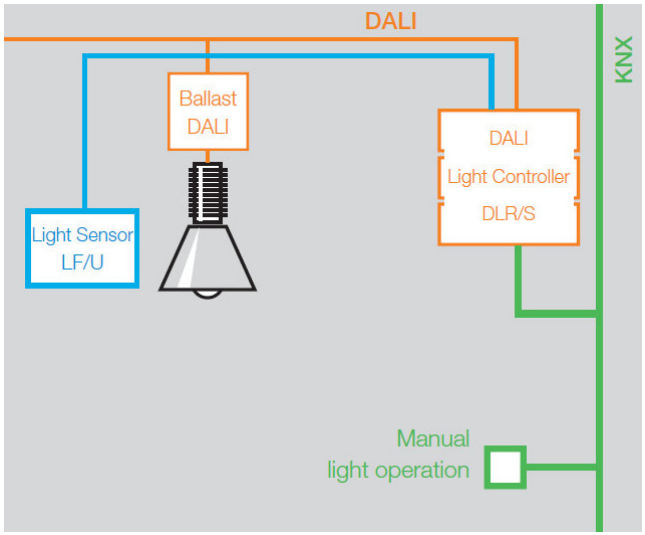
Webinar “Constant Light Control with KNX”
Commissioning - calibration process

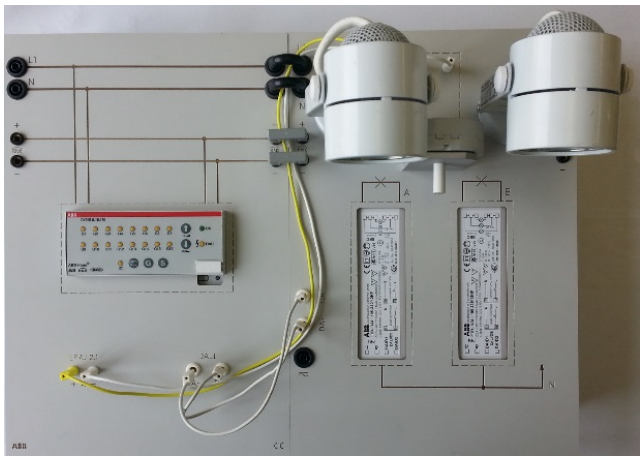
The following work must be carried out:

5. Assignment of group addresses to communication objects …



Webinar “Constant Light Control with KNX”
Practical Example





- In an office a group lamps will be switched and dimmed with Group 1 of DLR/S 8.16.1M
- A constant brightness level (app. 500 lx) in the working area is required
- The brightness from outside (Day, Night, Twilight) will be simulated by a lamp (Group 2 of DLR/S), operated from a 1-fold push button (switching and dimming) and influences the light sensor in the office
- With a 4-fold push button it is possible to switch and dim the light (Group 1) in the office (Rocker 1), a brightness value can be sent (Rocker 2) and the regulation can be enabled (Rocker 4)

Webinar “Constant Light Control with KNX”
Practical Example

- If the controlling is activated, it should not be possible to switch on or dim (Rocker 1)
- No daylight calibration is to be performed (factor for the daylight compensation can be entered manually)
- When the lower control limit is reached the Light Controller switches off the lighting automatically
- If it‘s getting darker, the Light Controller switches on the lighting again

Webinar “Constant Light Control with KNX”
Practical Example

- DLR/S
  - Group 1: Controlled by LF/U 2.1 (e.g. 500lx)
  - Group 2: Simulation sun
- Switch sensor 1-fold
  - Rocker 1: DLR/S Group 2 switch/dim (simulation sun)
- Switch sensor 4-fold
  - R1: DLR/S Group 1 switch/dim
  - R2: DLR/S Group 1 brightness value
  - R3: -
  - R4: DLR/S Group 1 activate light control

Webinar “Constant Light Control with KNX”
Practical Example

Comm.-object

- Rocker 1 short
- Rocker 1 long
- Rocker 2 value
- Rocker 3 -
- Rocker 4 switch

Switch sensor 4-fold
R1: Group 1 switch/dim
R2: Group 1 brightness value
R3: -
R4: Group 1 activate light control

Comm.-object

- Rocker 1 short
- Rocker 1 long

Switch sensor 1-fold
R1: Group 2 switch/dim
(simulation sun)

Comm.-object

- Group 1 switch
- Group 1 status switch.
- Group 1 relative dim.
- Group 1 brightn. value
- Group 1 Status brightn.
- Group 1 activate control
- Enable calibration
- Calibration artificial light
- Calibration daylight
- Group 1 …
- Group 2 switch
- Group 2 relative dim
- Group …

DALI Light Controller DLR/S 8.16.1M

or

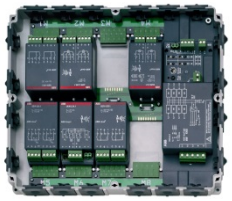
manual calibration process via ETS

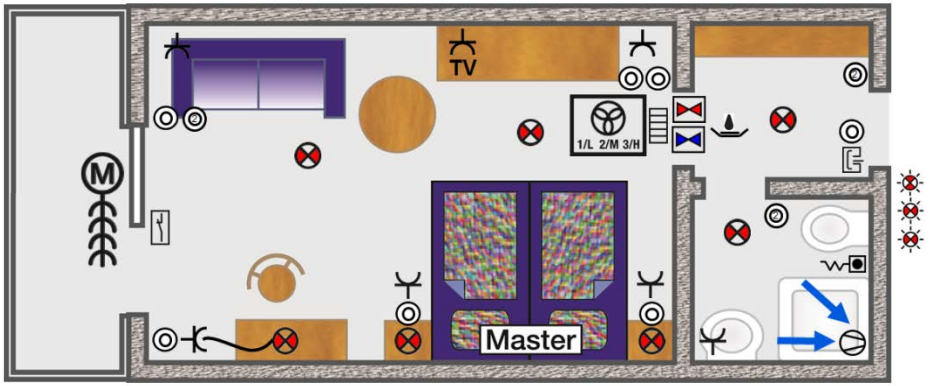
Webinar “Constant Light Control with KNX”
Further Documents

- Application Manual „Lighting“
- Practical knowledge “Constant lighting control”

- E-Learning module: DALI Light Controller

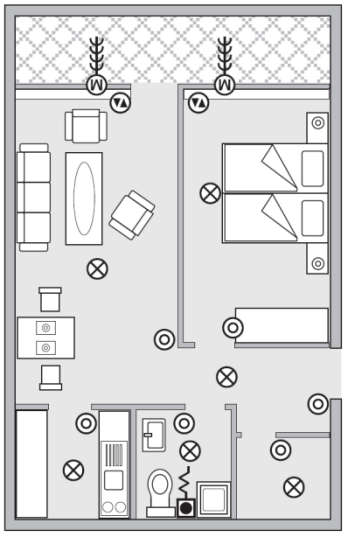
Webinar “Constant Light Control with KNX”
Next Webinar





Room Automation with KNX

1st of October 2014



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