APRIL 2020

KNX DALI Gateway Premium DG/S x.64.5.1 – “Human Centric Lighting”

Online Learning Session – Competence Center Europe – Smart Buildings

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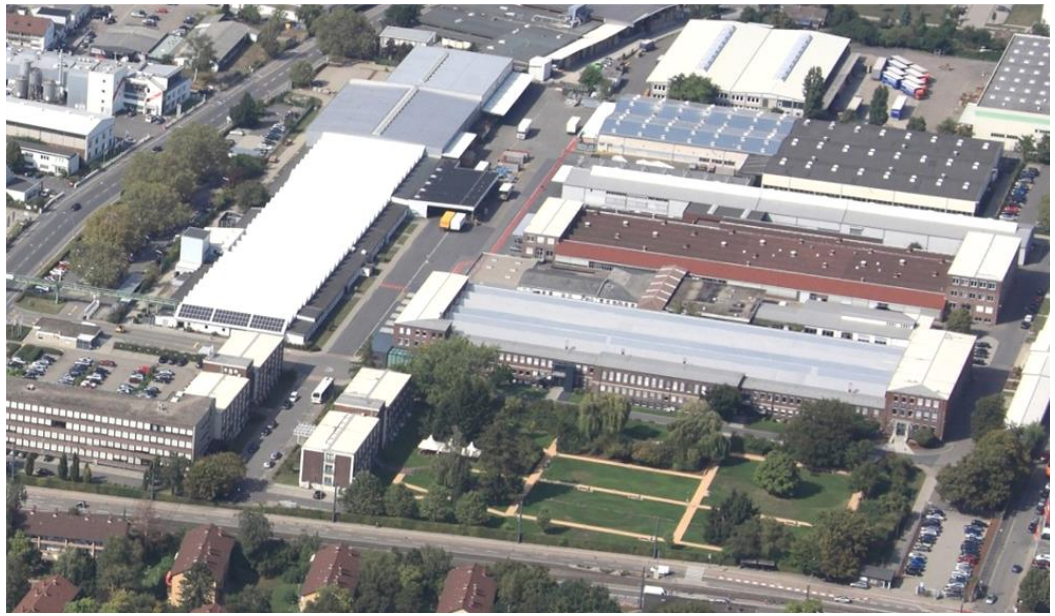
Online Learning Session – Competence Center Europe - Smart Buildings

NEW !!!

From home office to home office



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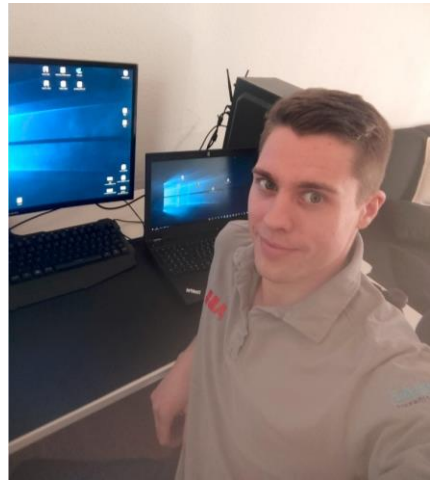

Agenda

What is Human Centric Lighting ?

Commissioning of the Colour function HCL

- ETS parameter
- Group objects
- Assignment of group addresses

ABB i-bus® Tool

KNX DALI Gateway Premium DG/S x.64.5.1 – “Human Centric Lighting”

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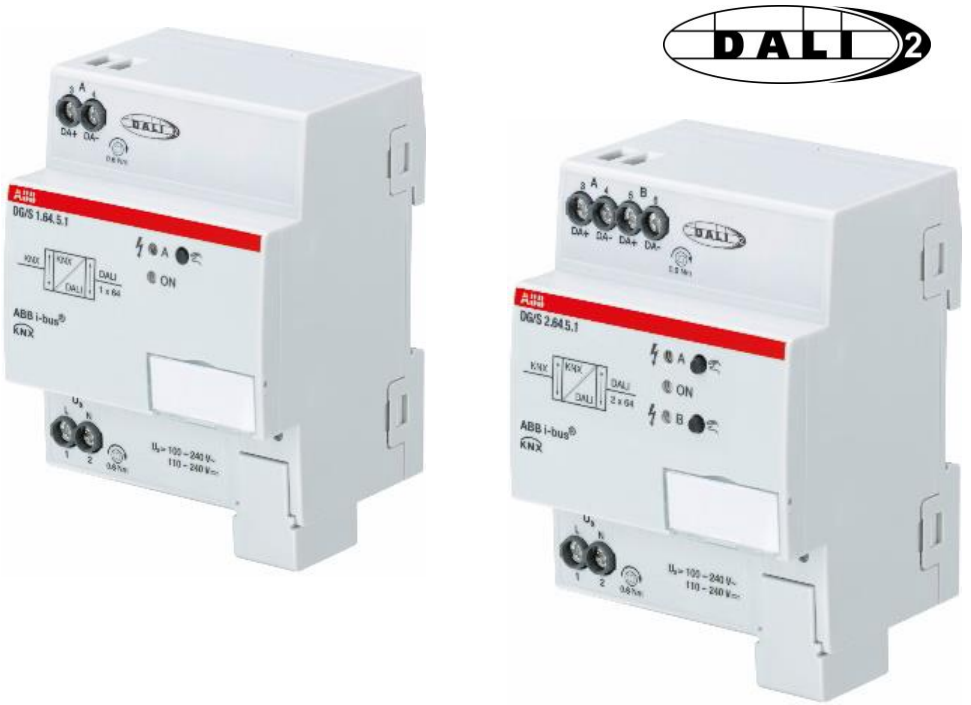
Hardware

– DG/S 1.64.5.1 (one channel, 64 ballasts)
– DG/S 2.64.5.1 (two independent channels, 2 x 64 ballasts)

The following ballast can be operated on the gateway

– Normal DALI ballasts (device type 0)
– DALI single battery emergency lighting converter (device type 1)
– Colour-controlled DALI ballast (device type 8)
– Functions
  - Flexible combination of DALI groups or single control
  - ABB i-bus® tool support
  - Templates
  - Tunable white
  - Dim2Warm
  - **Human Centric Lighting**
  - Standby Shutdown
  - …



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Colour function “Human Centric Lighting HCL”

What is Human Centric Lighting ?

The light of the sun is crucial for our health and well-being

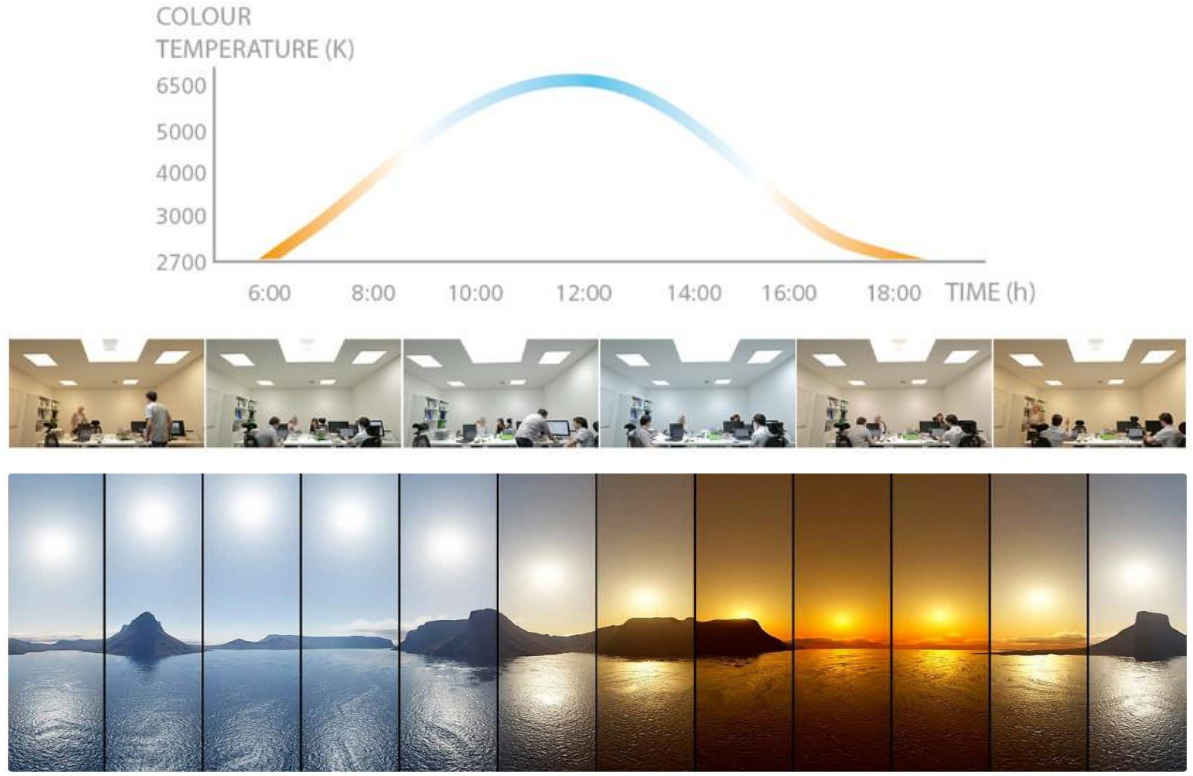
Every artificial light source should therefore match the properties of sunlight as closely as possible

Light affects our mood and level of activity

Human Centric Lighting can adapt people's daily rhythms to one another and increase their motivation, well-being and productivity

Because our physiological response to light depends on the properties of light such as colour spectrum, intensity and timing, the properties of artificial light in our environment are of great importance when we spend a long time in closed rooms

Solutions with Human Centric Lighting can promote the circadian rhythm, improve the ability to concentrate, prevent sleep disorders and increase our general well-being



Source: Internet

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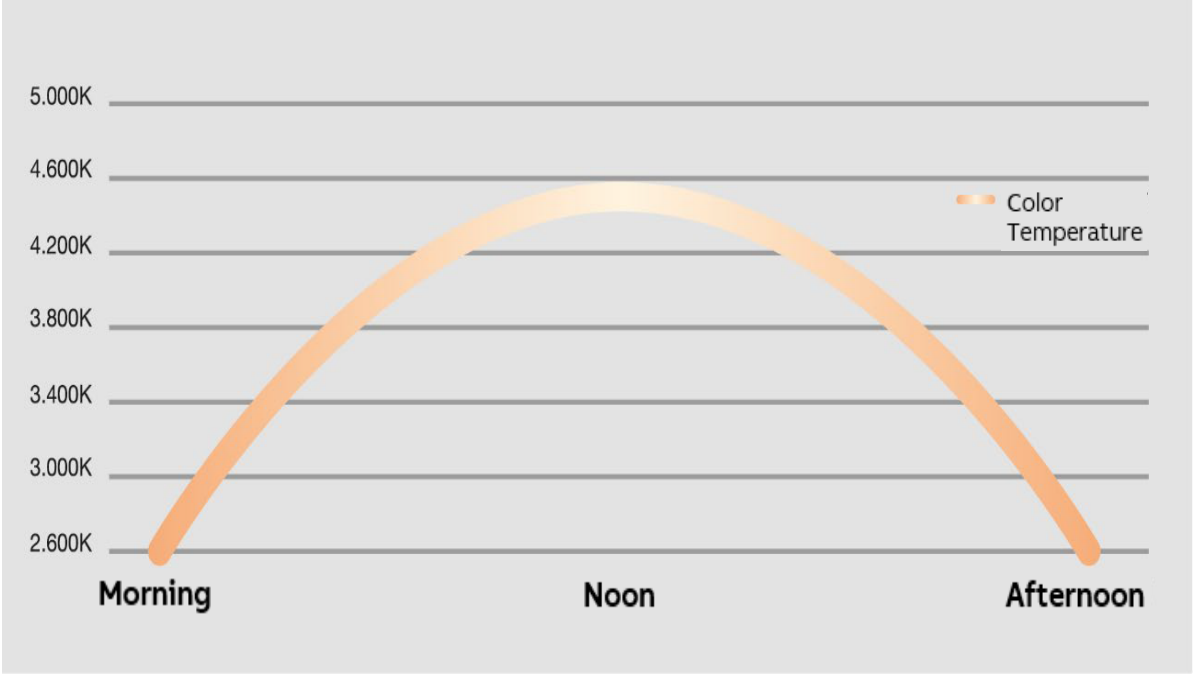
Colour function “Human Centric Lighting HCL”

Principle

With Human Centric Lighting (HCL), the daylight is simulated in the building, means the colour temperature of the outside light is reproduced by colour temperature controllable lights in the room

Actually it is the function tunable white, automized for a dynamic and suitable light situation with change of colour temperature over the day and with all positive aspects mentioned before

In complex HCL lighting systems, brightness, light distribution, direction of light and colour temperature are varied. The dynamic of the daylight, the seasons and the location of the building are considered. Furthermore special light situation can be created, e.g. scene with cold light for focused working at a machine.



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Colour function “Human Centric Lighting HCL”

HCL solutions in educational institutions

A classroom is equipped with tunable white lights, which are partly controlled by an automatic sequence and partly via a control element/panel

The automatic sequence is parameterized in the DALI gateway (rising and falling ramp plus transition times)

The teacher can set a focus light with a short-term alertness-promoting effect for concentration tasks and a relaxation light during relaxation phases

- Energy light in the morning or focus light for class examinations: High illuminance, 6500 K
- Automatic light for normal activities: Normal illuminance and HCL active
- Relaxation light for relaxation phases and for storytelling: Normal illuminance, 2700 K

Source: Internet

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Colour function “Human Centric Lighting HCL”

HCL in offices

People spend most of their time awake in closed rooms

For this reason, office space is an excellent place for introducing Human Centric Lighting solutions

Such solutions can improve the energy and motivation of employees

- Exposure to more intense light can increase the feeling of alertness and vitality of the employee during the day and at night
- Intense, blue-enriched light can affect the individual's ability to maintain constant attention and cognitive performance during the day and at night
- Exposure to light during the day that affects the circadian rhythm can have a positive effect on the sleep of the worker the following night

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Colour function “Human Centric Lighting HCL”

HCL in healthcare facilities

In hospitals and nursing homes, residents often suffer from a lack of daylight due to their illness or restricted mobility

The long stay in closed rooms can interrupt the sleep patterns

Patients with dementia or other cognitive disorders in particular are sensitive to the loss of daylight

- Avoid mood swings and depression
- The emotional and physical well-being improves due to the more relaxing nights
- Reduce the need for sedatives
- The lack of daylight is compensated, which counteracts insomnia
- Improved employee well-being

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Colour function “Human Centric Lighting HCL”

HCL in industry

Lighting Installations with high illuminance and "tunable white" can have a positive effect on production output and reduce fatigue, errors and accidents

These effects are even greater with repetitive work tasks

Higher illuminance in combination with the correct light colour spectrum and careful timing of the different light settings can lead to increased alertness and attention among industrial workers

The result is less fatigue, which in turn reduces the risk of mistakes

For shift workers, the light can be used to shift the phases of the daily rhythm and to adapt more easily to the night work

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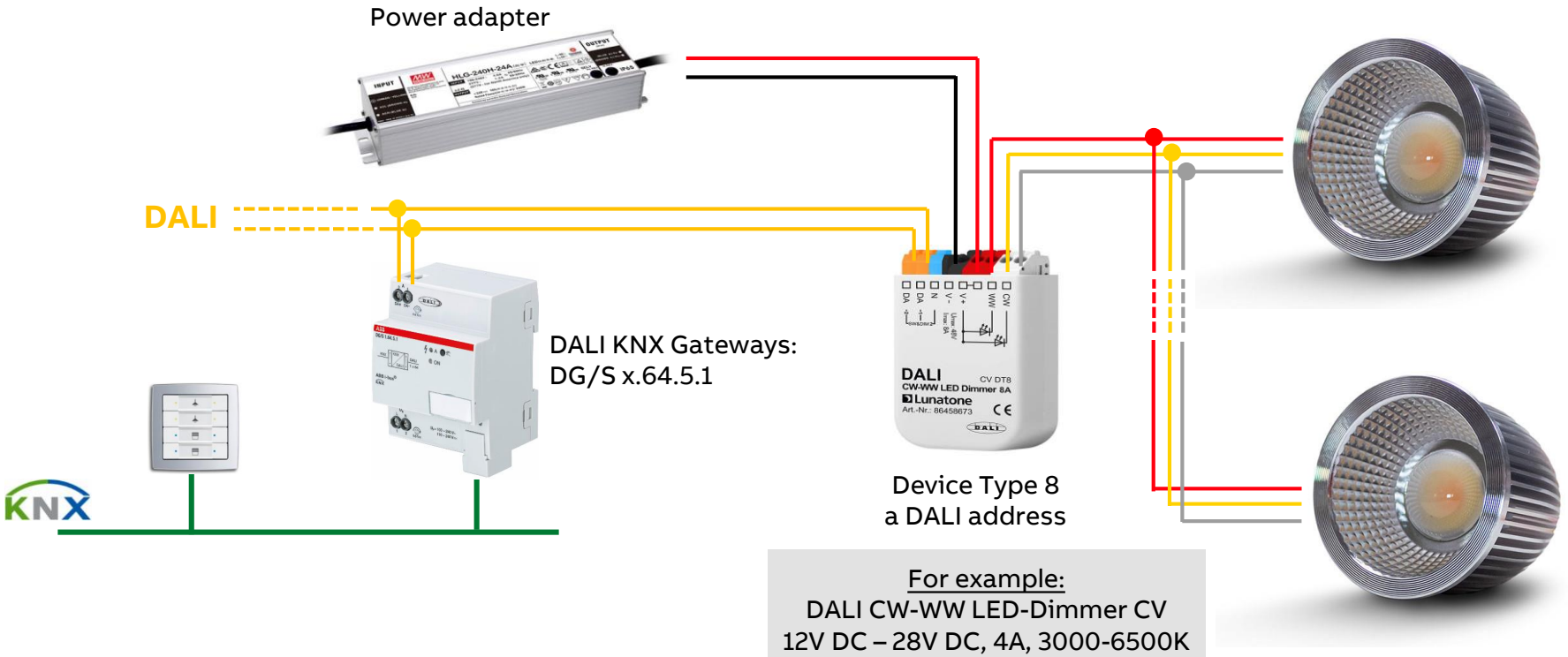
Colour function “Human Centric Lighting HCL” – Example: Hardware for Tunable White with DALI and KNX



For example:
Spot Deep Tunable white CV
8 W, 750 lm, 2200-6500 K
Manufacturer: ConstaLED
Manufacturer number: 31362

For example:
DALI CW-WW LED-Dimmer CV
12V DC – 28V DC, 4A, 3000-6500K
Manufacturer: Lunatone
Manufacturer number: 89453836

Source: Internet

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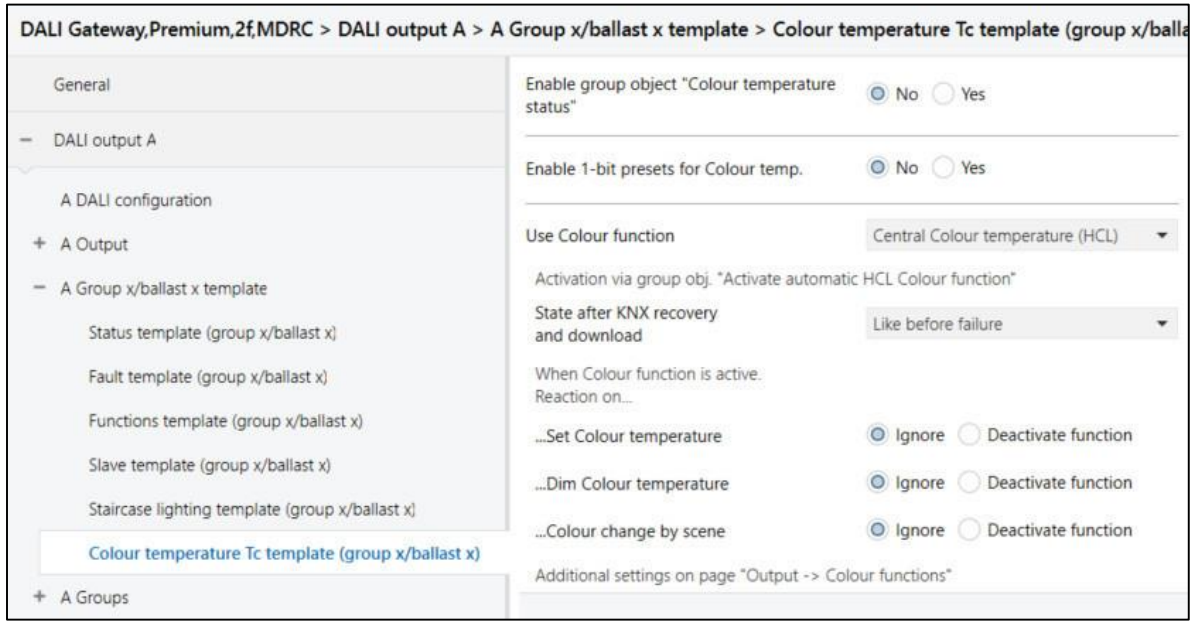
Colour function “Human Centric Lighting HCL”

Commissioning of the Colour function HCL

– Set ETS parameter: DALI Output A → Group X or ballast X → Colour functions … (template or individual)
  - Enable the colour function “Central Colour temperature (HCL)” for the group/ballast
  - “State after KNX recovery and download”
  - Reaction on “Set colour temperature, “Dim colour temperature” and “Colour change by scene” when Colour function is active

– Set ETS parameter: DALI Output A → Output → Colour functions
  - HCL colour temperature source (16-bit group object *“Colour temperature*” or 1-bit group object *“Ramp curve*”)
  - Enable the group object “*Output – Activate automatic HCL colour function colour function*” (if necessary)



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Colour function “Human Centric Lighting HCL”

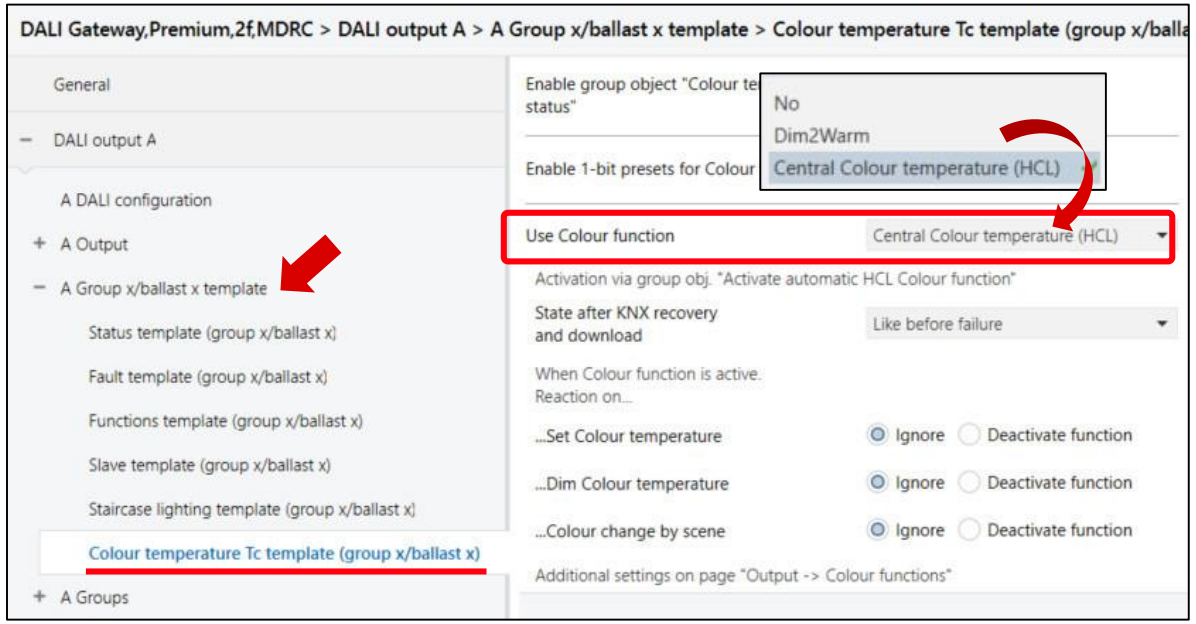
Use colour function (per group/ballast)

This parameter determines whether a colour function is used

HCL only controls the color temperature and has no influence on the brightness (dimming, value)

Only the Dim2Warm or HCL colour function can be used per group/ballast

- No
  - No colour function is used
- Dim2Warm
  - The Dim2Warm colour function is used
  - All Dim2Warm settings are active
- Central colour temperature (HCL)
  - The central colour temperature (HCL) colour function is used
  - All HCL settings are active



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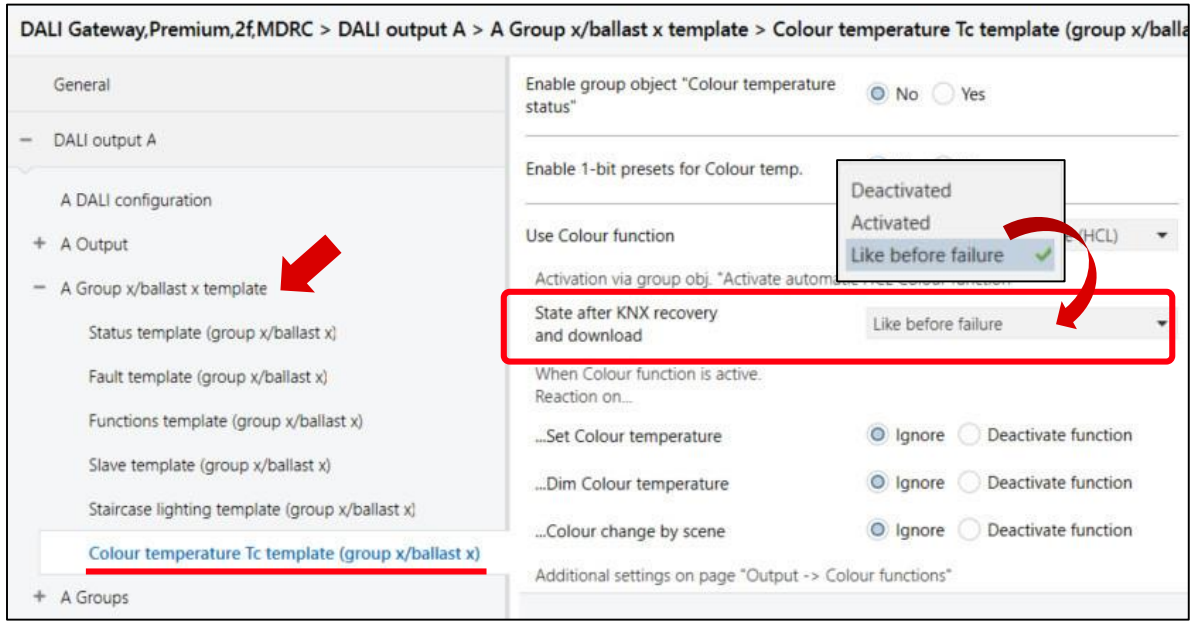
Colour function “Human Centric Lighting HCL”

State after KNX recovery and download (per group/ballast)

This parameter defines the state of the Colour function after KNX bus voltage recovery or a download

– Deactivated
  - The Colour function is deactivated after KNX bus voltage recovery
  - The group/ballast reacts like a normal group/ballast without an additional function
– Activated
  - The Colour function is activated after KNX bus voltage recovery or a download
– Like before failure
  - The Colour function retains the operating state (activated or deactivated) that it had before the KNX bus voltage recovery or download



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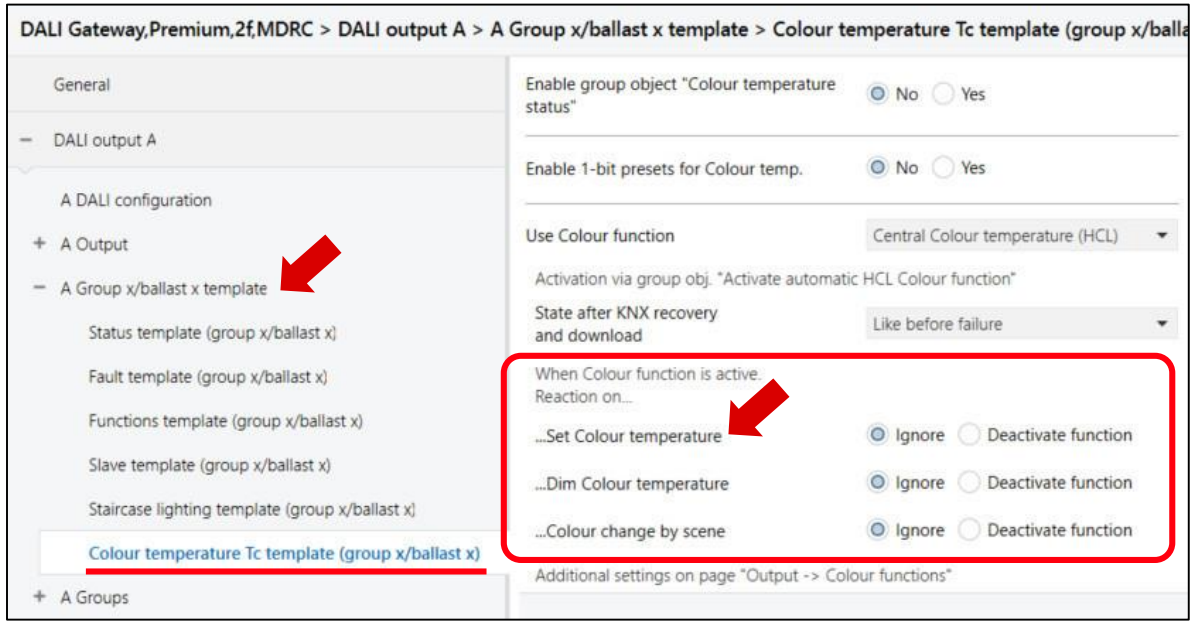
Colour function “Human Centric Lighting HCL”

Active Colour function: Reaction on “Set colour temperature”

This parameter describes how the group/ballast responds if a colour temperature is set while the colour function Human Centric Lighting HCL is active

– Ignore
  - The colour temperature setting is ignored
  - The colour function remains active
– Deactivate function
  - Setting a colour temperature deactivates the colour function and the group/ballast adopts the set colour temperature



Nu	Group Address	Name	Object Function	Length	Data Type
86	1/4/86	Output A - group 1	Set Colour temperature (K)	2 bytes	absolute colour temperature (K)

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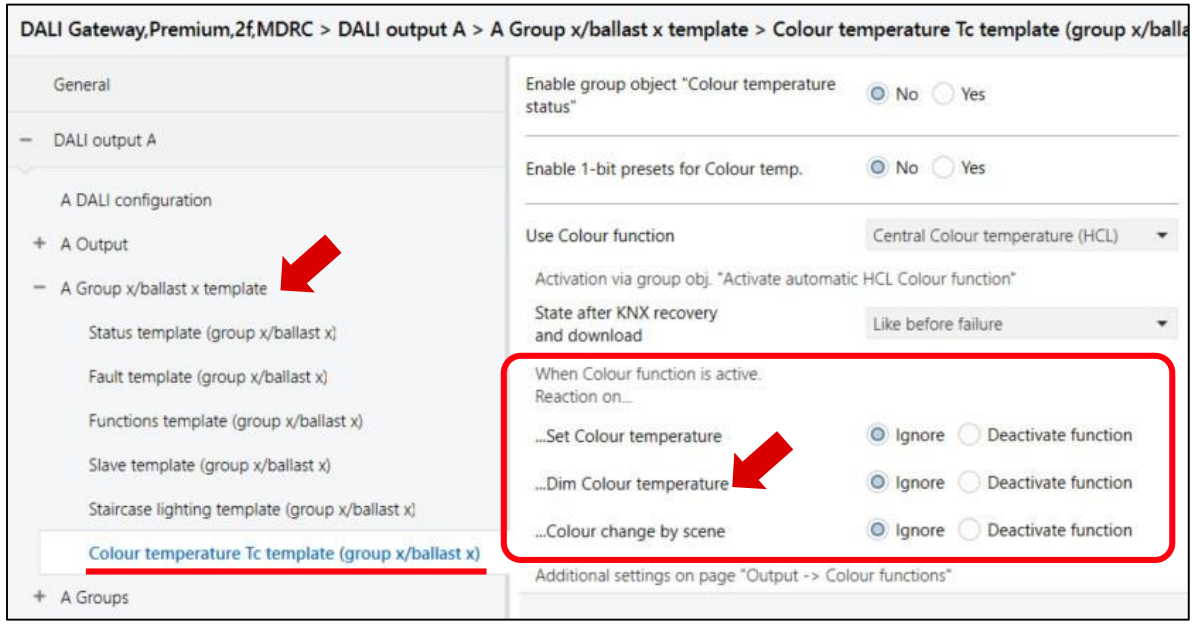
Colour function “Human Centric Lighting HCL”

Active Colour function: Reaction on “Dim colour temperature”

This parameter describes how the group/ballast responds if the colour temperature is dimmed while the colour function Human Centric Lighting HCL is active

– Ignore
  - The Colour function remains active and the colour temperature dimming is ignored

– Deactivate function
  - Dimming a colour temperature deactivates the colour function and the group/ballast adopts the dimmed colour temperature



Nu	Group Address	Name	Object Function	Length	Data Type
87	1/4/87	Output A - group 1	Dim Colour temperature	4 bit	dimming control

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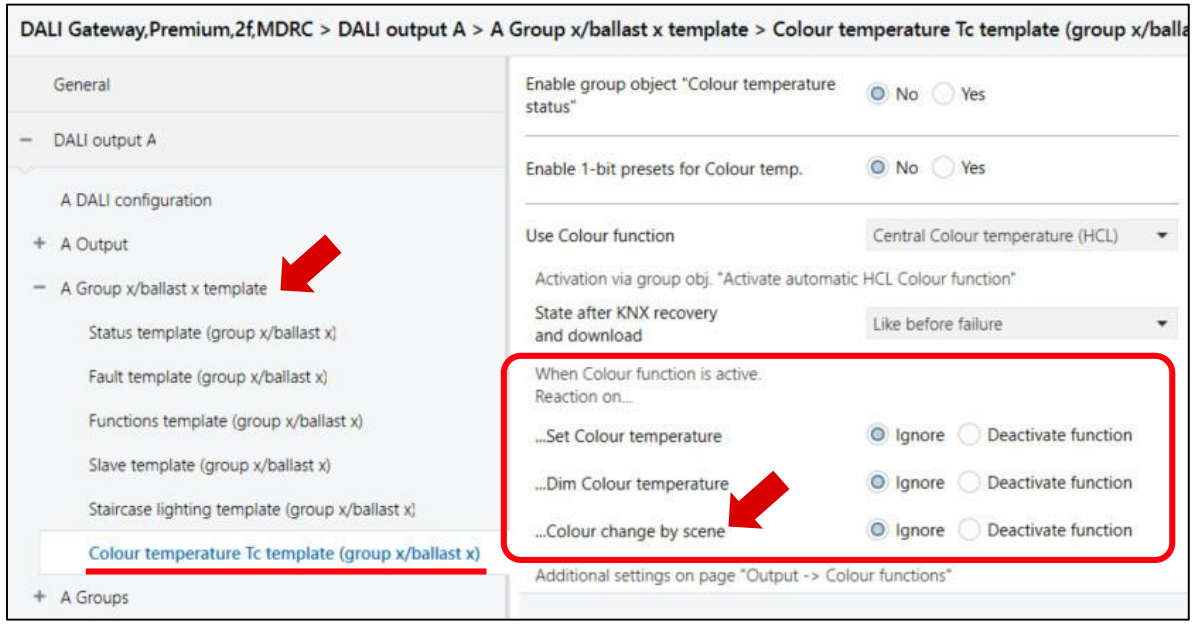
Colour function “Human Centric Lighting HCL”

Active Colour function: Reaction on “Colour change by scene”

This parameter defines how the group/ballast responds if a colour is recalled by a scene retrieval while the colour function Human Centric Lighting HCL is active

– Ignore
  - The Colour function remains active and the scene retrieval colour change is ignored

– Deactivate function
  - The Colour function is deactivated as soon as a colour change is recalled by a scene retrieval
  - The group/ballast adopts the colour temperature of the scene



Nu	Group Address	Name	Object Function	Length	Data Type
35	1/4/35	Output A	KNX scene 1...64	1 byte	scene control

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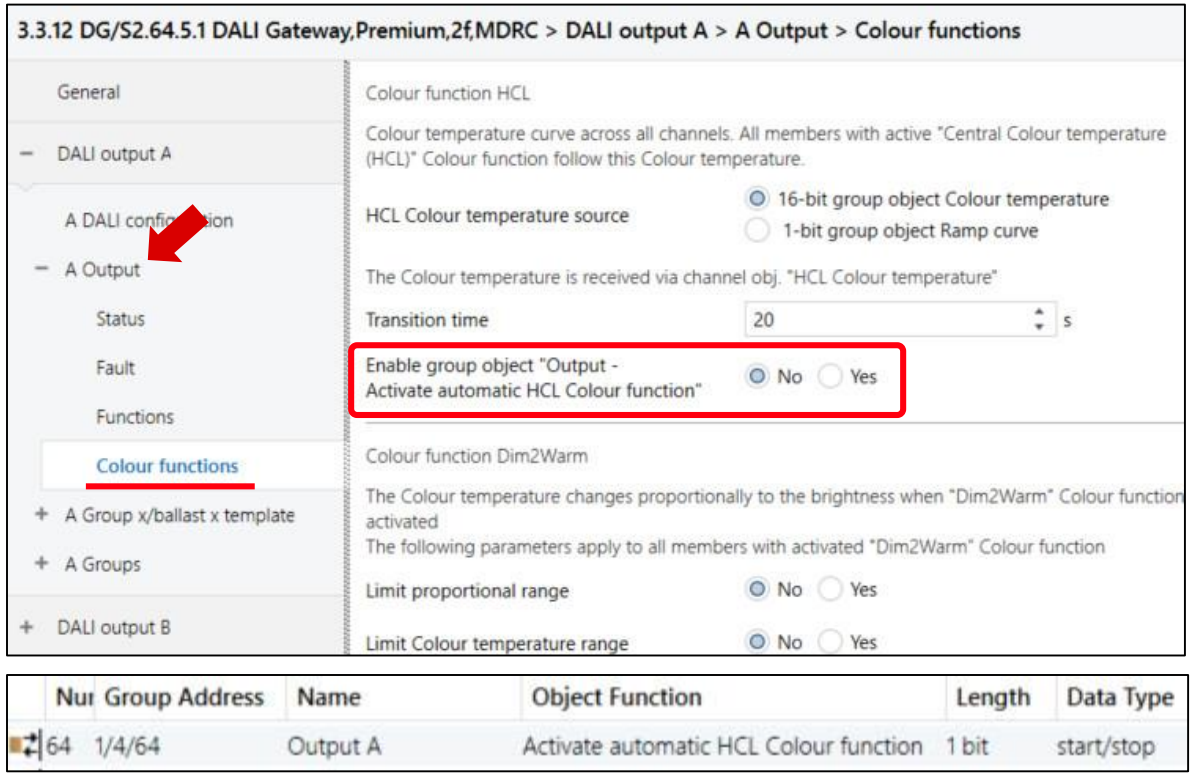
Colour function “Human Centric Lighting HCL”

Group object “Output – Activate automatic HCL colour fct.”

This parameter enables the *“Output – Activate automatic HCL colour function”* group object, which automatically activates and deactivates the HCL function for the whole output

– No
  - The “*Output – Activate automatic HCL colour function*” group object is not enabled
  - The Human Centric Lighting HCL function is activated/ deactivated for each parameterized group/ballast

– Yes
  - The *“Output – Activate automatic HCL colour function”* group object is enabled and can automatically activate/deactivate the parametrized HCL colour function on <u>all ballasts/groups</u> on the output



Nu	Group Address	Name	Object Function	Length	Data Type
64	1/4/64	Output A	Activate automatic HCL Colour function	1 bit	start/stop

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Colour function “Human Centric Lighting HCL”

Activation/deactivation of the HCL colour function

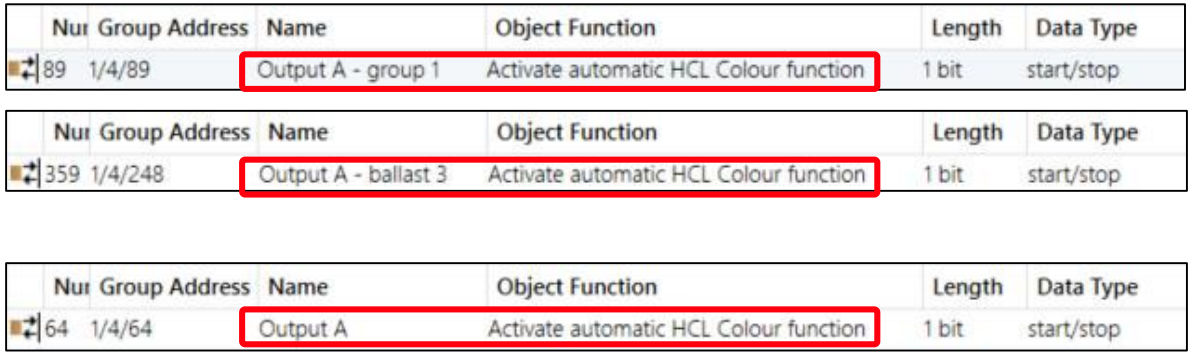
The Human Centric Lighting HCL colour function is activated and deactivated via a group object

- Individually for each group
- Individually for each ballast
- Centrally for all group/ballasts per output for which the HCL function is parametrized

Telegram value:

- 1 = Activates the HCL colour function
- 0 = Deactivates the HCL colour function

Furthermore, the state after KNX recovery and download can be set (deactivated, activated or like before failure)



Nu	Group Address	Name	Object Function	Length	Data Type
89	1/4/89	Output A - group 1	Activate automatic HCL Colour function	1 bit	start/stop

Nu	Group Address	Name	Object Function	Length	Data Type
359	1/4/248	Output A - ballast 3	Activate automatic HCL Colour function	1 bit	start/stop

Nu	Group Address	Name	Object Function	Length	Data Type
64	1/4/64	Output A	Activate automatic HCL Colour function	1 bit	start/stop

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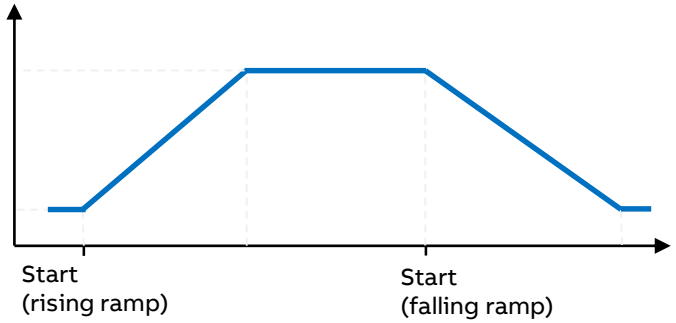
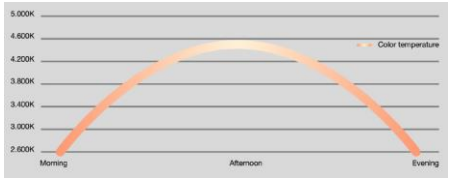
Colour function “Human Centric Lighting HCL”



Internal:
Ramp curve

or



HCL controller

External:
Colour temperature values

e.g. BMS,
visualisation, …

HCL colour temperature source

DALI

KNX

Source: Internet

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Colour function “Human Centric Lighting HCL”

Colour function HCL colour temperature source

This parameter specifies the HCL colour temperature source

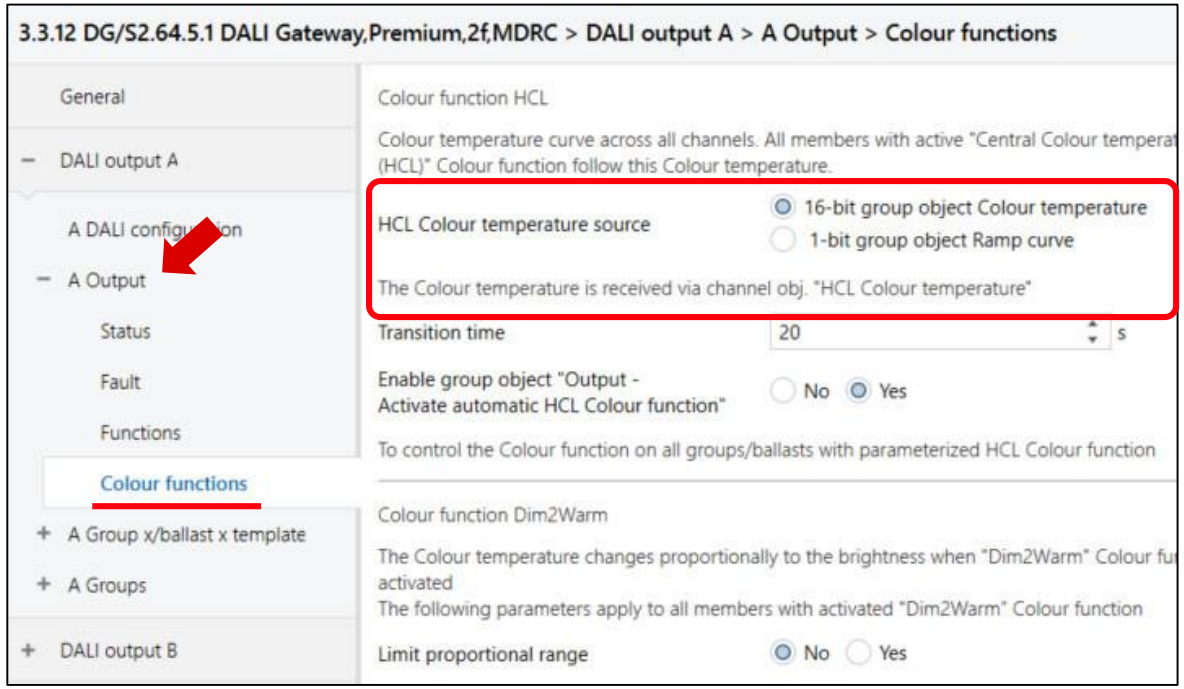
The colour temperature curve applies to the channel
→ All groups/ballast with active “Central Colour temperature (HCL)” Colour function follow this colour temperature

HCL colour temperature source:

– 16-bit group object *“HCL Colour temperature”* → external
  - A visualization, BMS, … calculates and provides cyclically colour temperature values

– 1-bit group object Ramp curve → internal
  - Start a parametrizable colour temperature ramp curve (rising and falling ramp)

Each source option has different HCL characteristics



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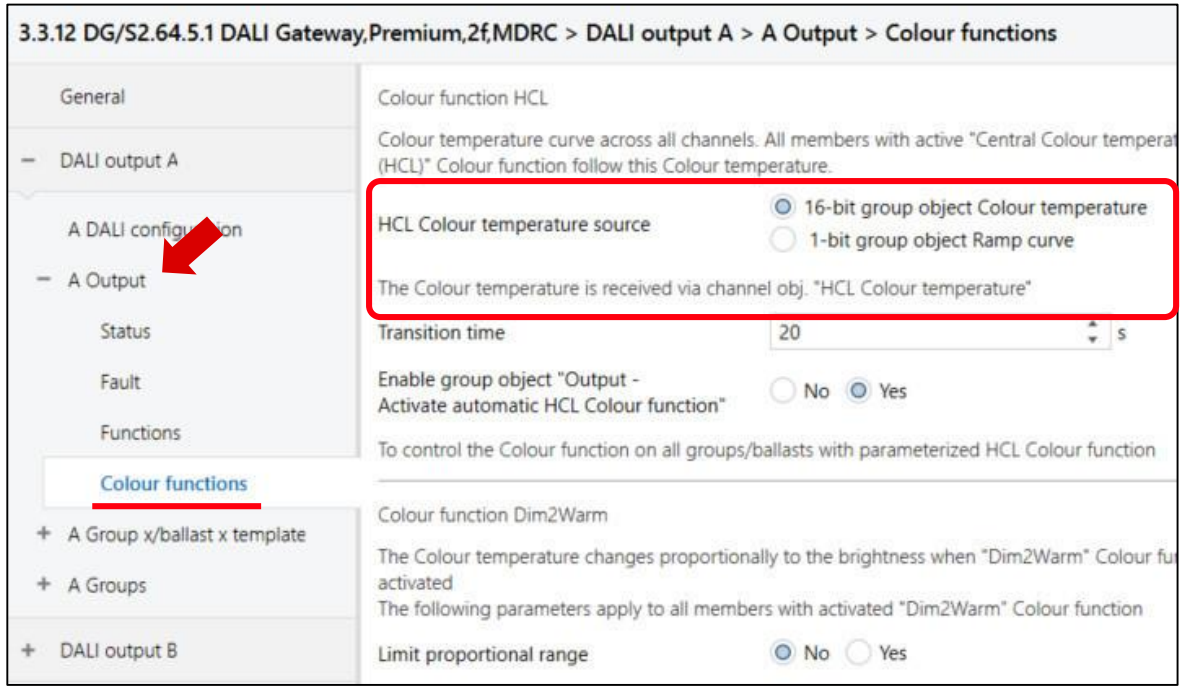

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Colour function “Human Centric Lighting HCL” – Colour temperature source: “16-bit group object (external)”

HCL colour temp. source: “16-bit group object CT (ext.)”

A visualization, BMS, … calculates and provides cyclically colour temperature values

→ Individual and different curves are possible

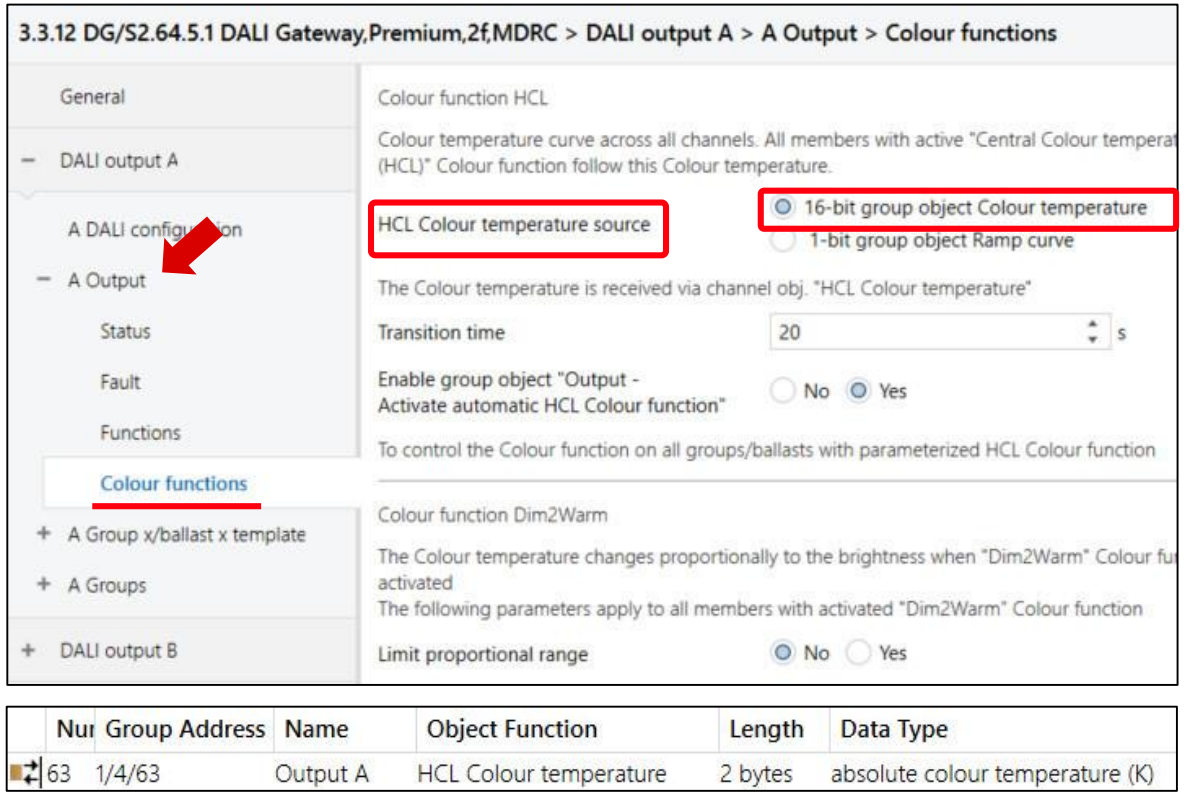
The 16-bit group object is the source for the HCL characteristic

This group object receives a colour temperature value that is used to control HCL

The DALI gateway dims all included ballasts/groups to the colour temperature value

The more often the group object sends new values, the more accurately the lighting mimics the passage of the day

If a group/ballast is switched on while HCL is activated the last received color temperature value is dimmed within 5 seconds



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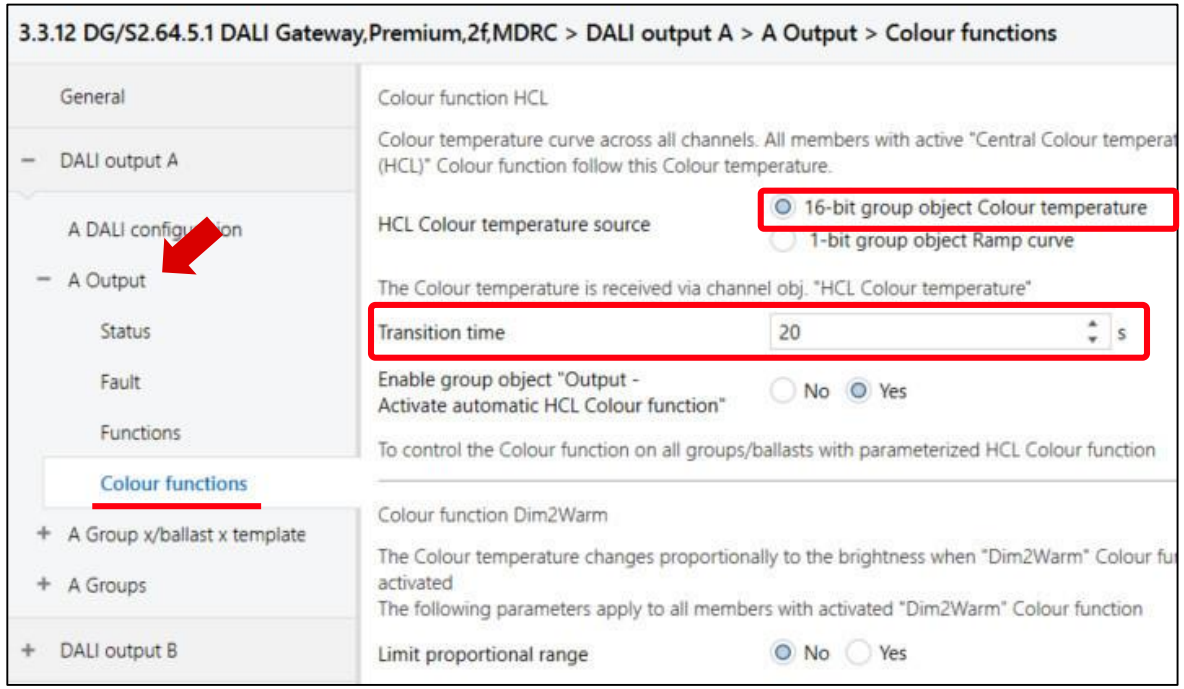
Colour function “Human Centric Lighting HCL” – Colour temperature source: “16-bit group object (external)”

Transition time

This parameter defines the time it takes for the HCL curve to adopt the new colour temperature values

– 0…20…65,535 sec



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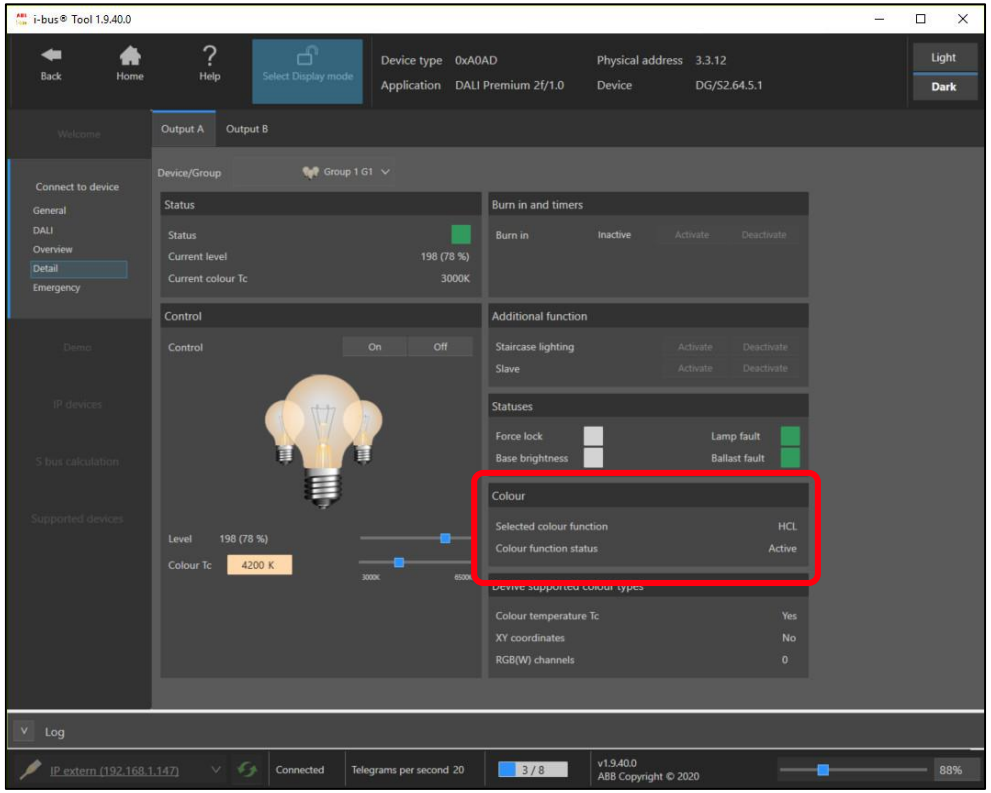
Colour function “Human Centric Lighting HCL” – Colour temperature source: “16-bit group object (external)”

ABB i-bus® Tool

The selected and the state of the Colour function “Human Centric Lighting HCL” is displayed

The prerequisite is that the additional function is parameterized in the ETS



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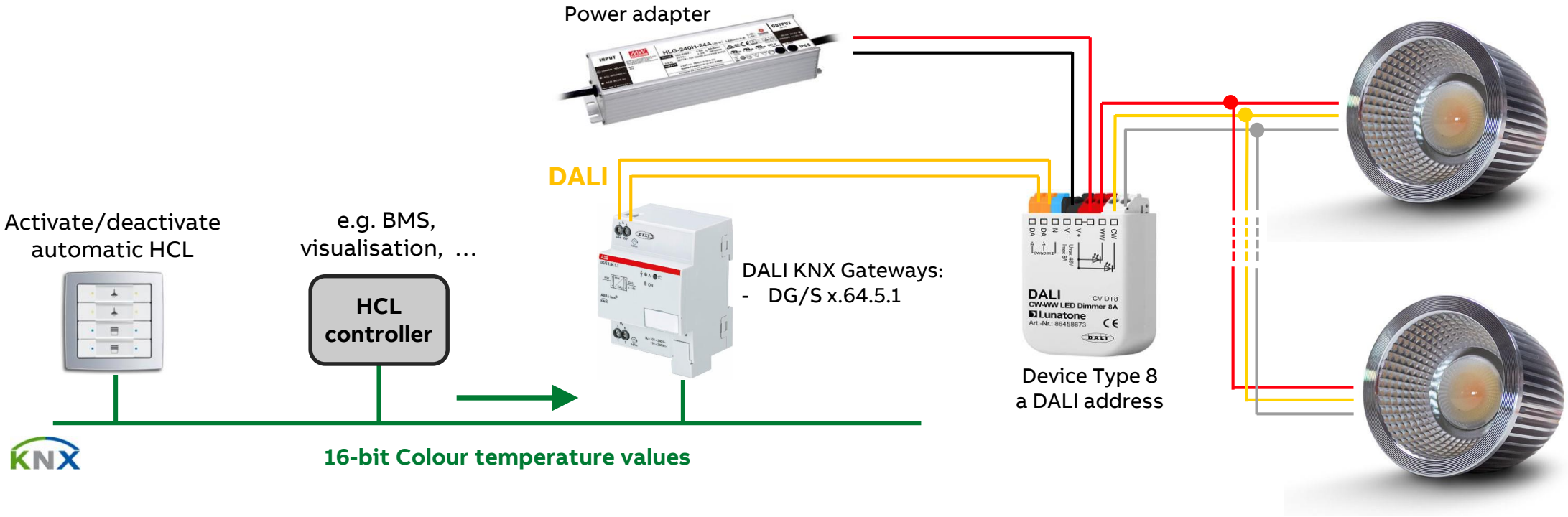
Colour function “Human Centric Lighting HCL” – Colour temperature source: “16-bit group object (external)”



Source: Internet

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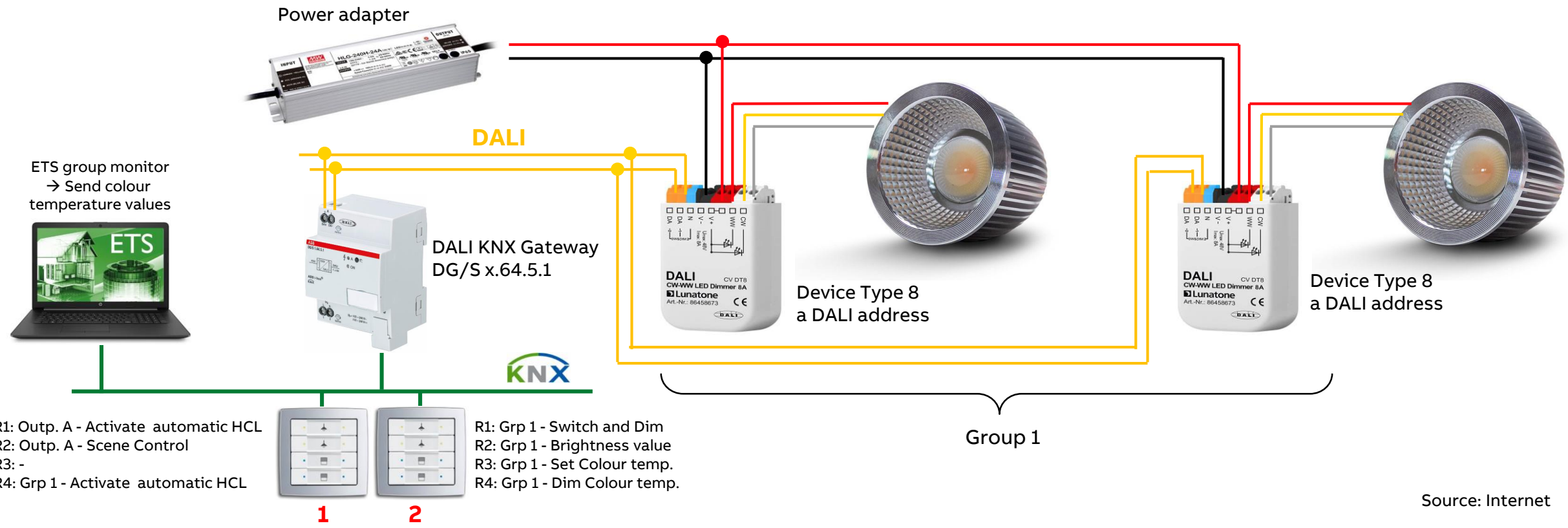
Colour function “Human Centric Lighting HCL” – Colour temperature source: “16-bit group object (external)”



Source: Internet

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Colour function “Human Centric Lighting HCL” – Colour temperature source: “16-bit group object (external)”
Example: Assignment of Group Addresses

DALI Gateway Premium DG/S x.64.5.16

Output A	Switch (1 bit)
	Relative dimming (4 bit)
	…
	HCL Colour temperature (2 byte)
	Activate autom. HCL Colour function (1 bit)
	KNX Scene 1…64 (1 byte)
	…
Output A – group/ballast X	… Activate autom. HCL Colour function (1 bit)
	… Switch (1 bit)
	… Relative dimming (4 bit)
	… Status Switch (1 bit)
	… Brightness value (1 byte)
	… Status Brightness value (1 byte)
	… Set Colour temperature (2 byte)
	… Dim Colour temperature (4 bit)
	… Status Colour temperature (2 bytes)

ETS Group monitor	…	
	… calculated colour temperature values (2 byte)	
	…	
Control element solo®	… S1.1 Switching (1 bit)	1
	… S2.1 Number light scene(1 byte)	
	… S4.1 Switching (1 bit)	
Control element solo®	… S1.1 Switching (1 bit)	
	… S1.1 Relative dimming (4 bit)	
	… LED 1.1 Status (1 bit)	
	… LED 1.2 Status (1 bit)	2
	… S2.1 Value Switching (1 byte)	
	… S3.1 Value Switching (2 byte)	
	… S4.1 Switching (1 bit)	
	… S4.1 Relative dimming (4 bit)	

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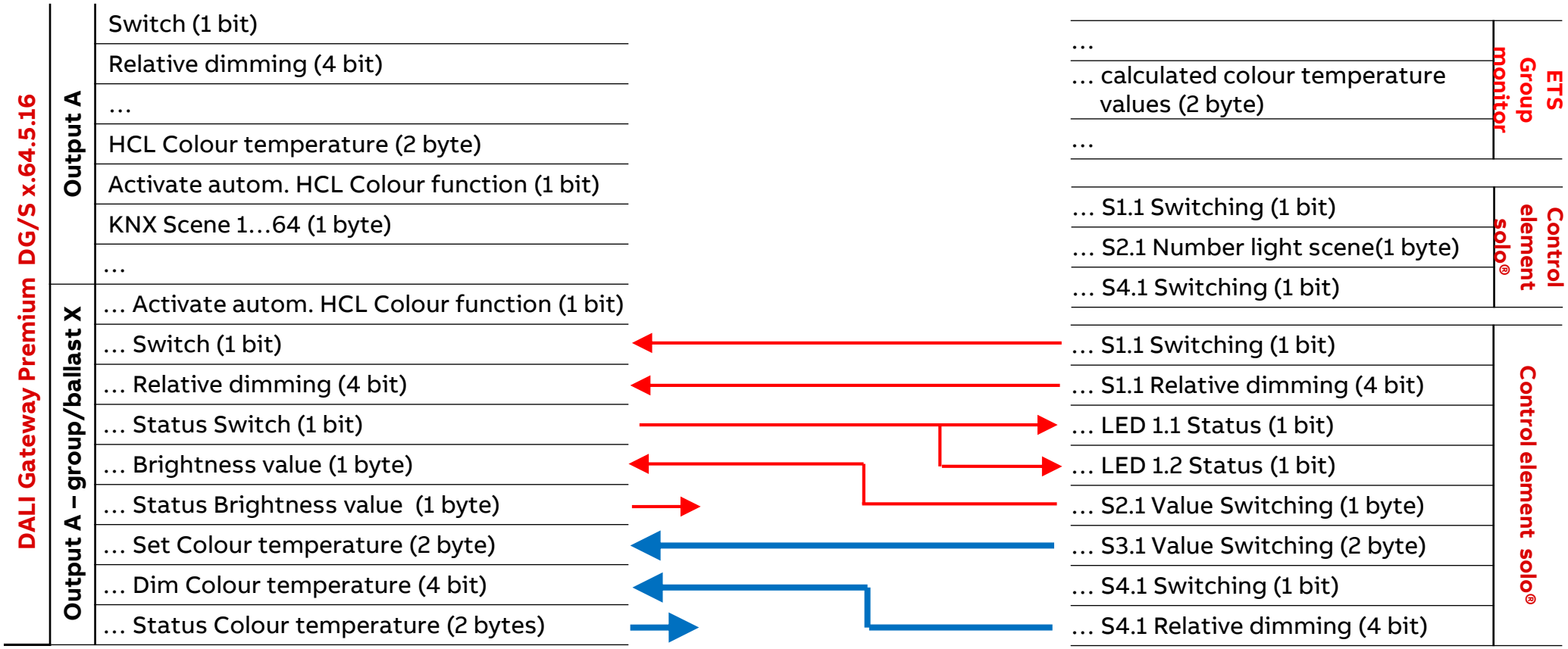
Colour function “Human Centric Lighting HCL” – Colour temperature source: “16-bit group object (external)”
Example: Assignment of Group Addresses



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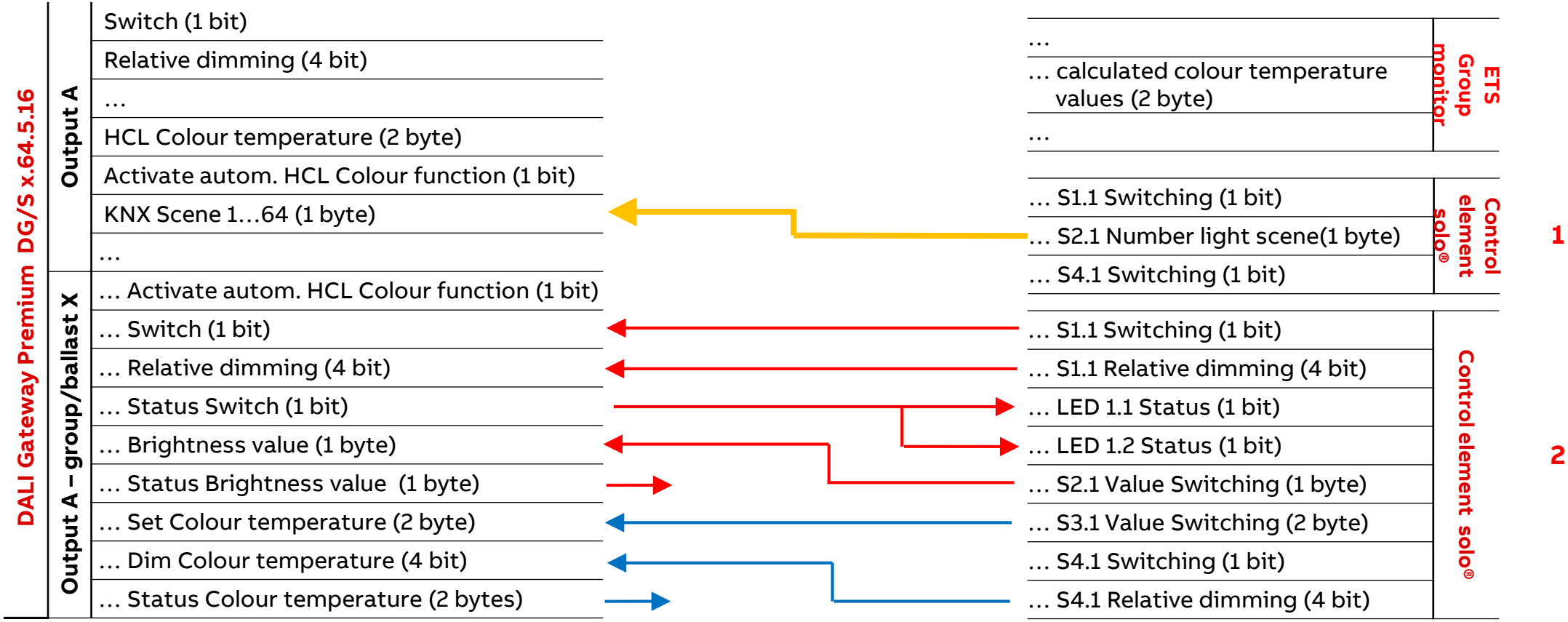
Colour function “Human Centric Lighting HCL” – Colour temperature source: “16-bit group object (external)”
Example: Assignment of Group Addresses



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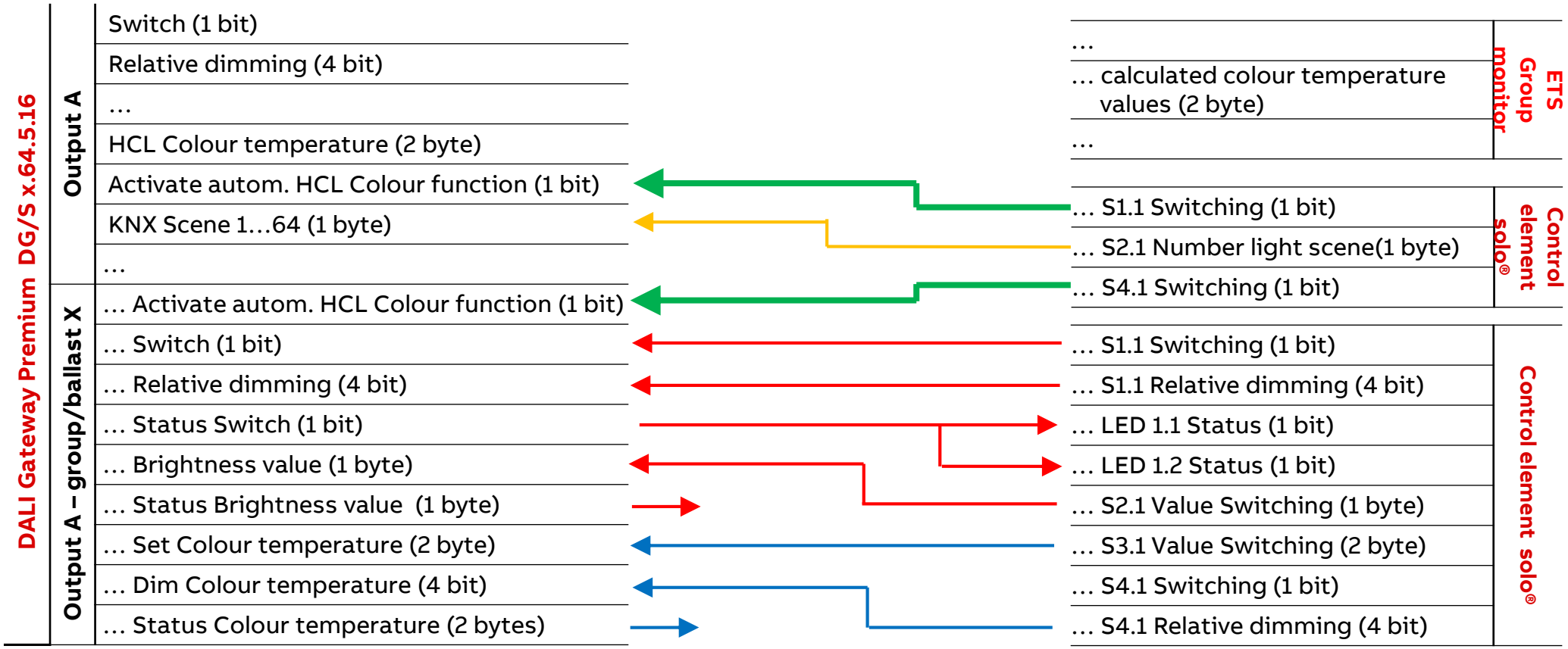
Colour function “Human Centric Lighting HCL” – Colour temperature source: “16-bit group object (external)”
Example: Assignment of Group Addresses



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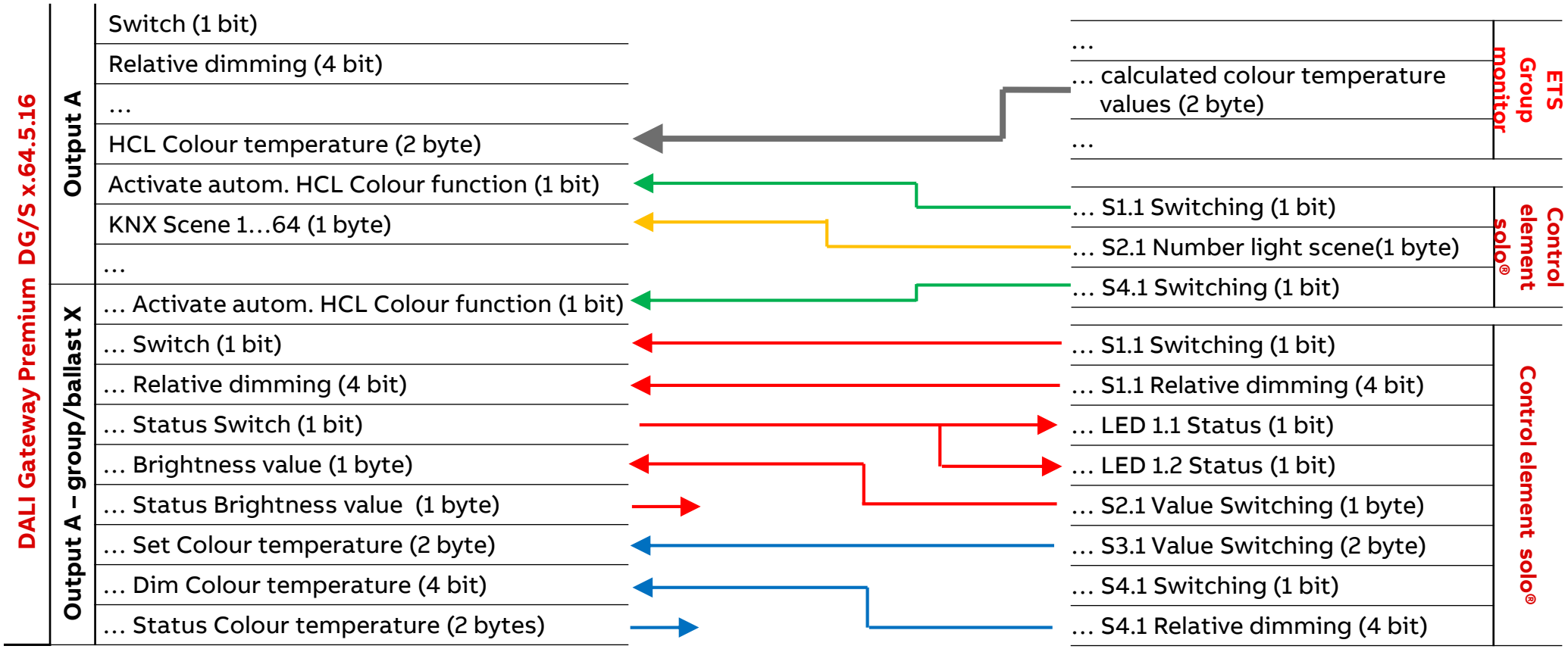
Colour function “Human Centric Lighting HCL” – Colour temperature source: “16-bit group object (external)”
Example: Assignment of Group Addresses



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Colour function “Human Centric Lighting HCL” – Colour temp. source: “1-bit group object Ramp curve (int.)”

Colour function HCL colour temperature source

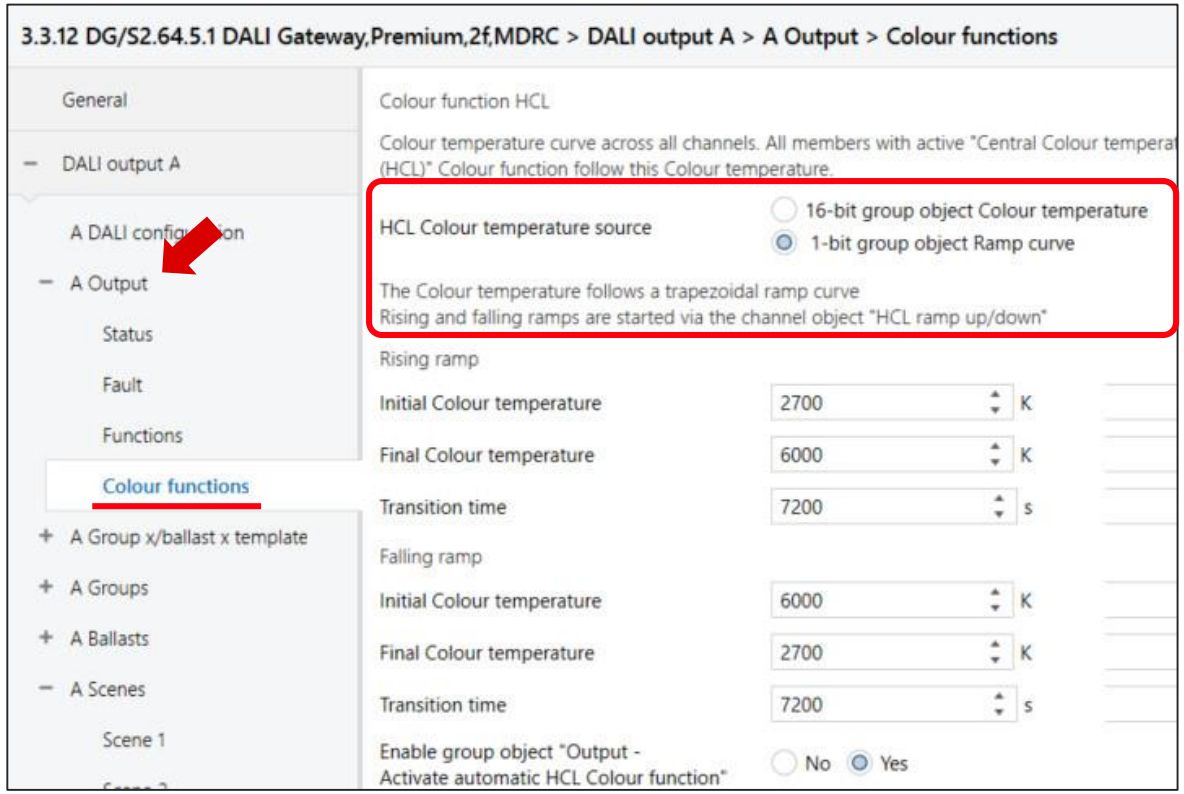
This parameter specifies the HCL colour temperature source

The colour temperature curve applies to the channel
→ All groups/ballast with active “Central Colour temperature (HCL)” Colour function follow this colour temperature

HCL colour temperature source:

– 16-bit group object “*HCL Colour temperature*” → external
  • A visualization, BMS, … calculates and provides cyclically colour temperature values
– 1-bit group object Ramp curve → internal
  • Start a parametrizable colour temperature ramp curve (rising and falling ramp)

Each source option has different HCL characteristics



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Colour function “Human Centric Lighting HCL” – Colour temp. source: “1-bit group object Ramp curve (int.)”

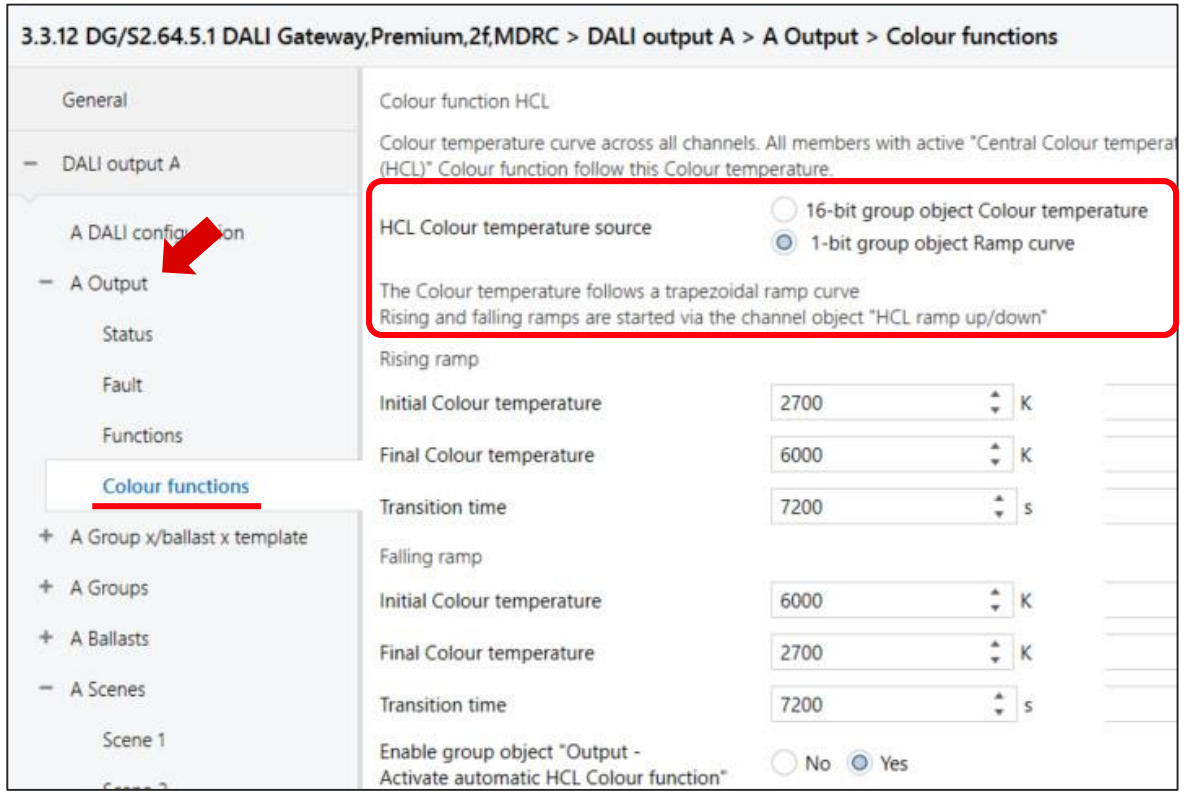
HCL colour temp. source: “1-bit group object Ramp curve (int.)”

The HCL ramp curve can easily mimic the passage of the day using colour temperature

A dynamic start of a simplified curve with rising and falling ramp plus transition times

Start of rising and falling ramp depending on time (sunrise and sunset time plus offset), e.g. with time switch FW/S 8.2.1, TR/A 1.1 and DCF- or GPS time

Transition times, initial and final colour temperature adjustable



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Colour function “Human Centric Lighting HCL” – Colour temp. source: “1-bit group object Ramp curve (int.)”

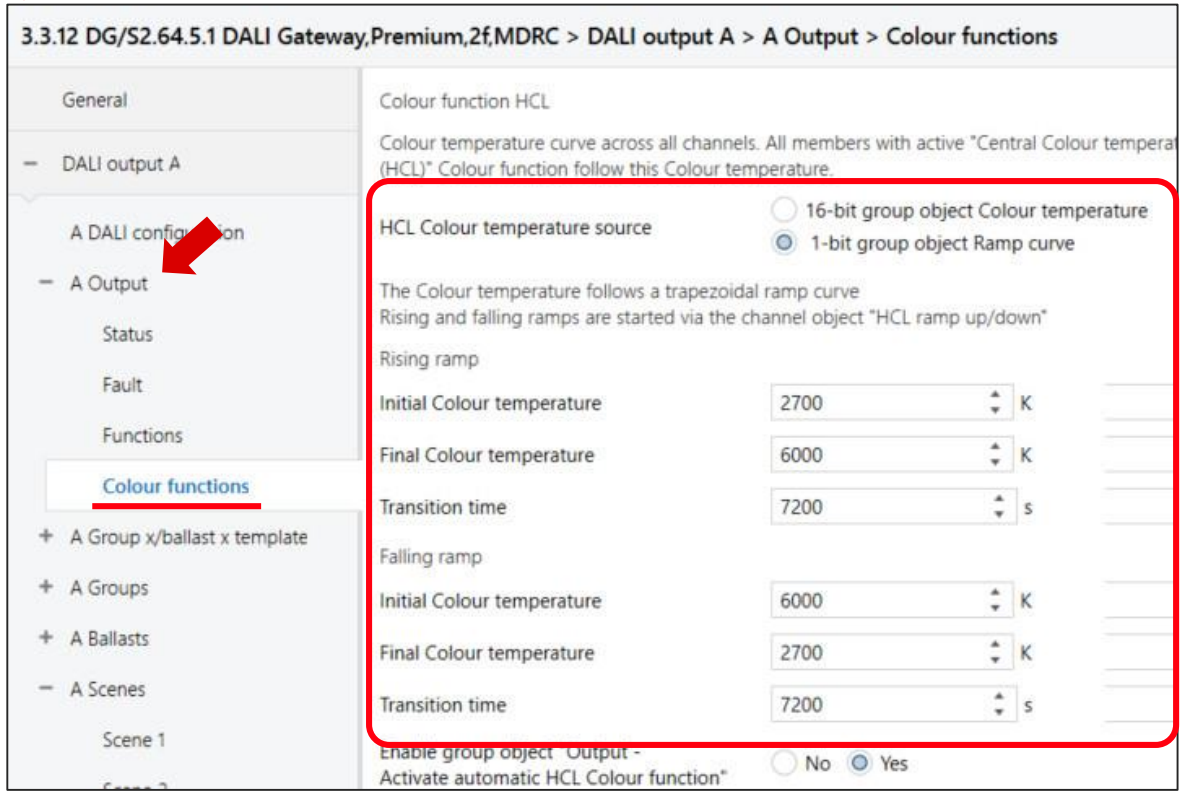
HCL colour temp. source: “1-bit group object Ramp curve (int.)”

Rising ramp

- Initial colour temperature at the start of the ramp up: 1,000…2,700…20,000 K
- Final colour temperature at the end of the ramp up: 1,000…6,000…20,000 K
- The transition time defines the ramp-up time, i.e. how long it takes for the ramp to go from beginning to end

Falling ramp

- Initial colour temperature at the start of the ramp down: 1,000…6,000…20,000 K
- Final colour temperature at the end of the ramp down 1,000 to 20,000 K
- The transition time defines the ramp-down time, i.e. how long it takes for the ramp to go from beginning to end



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Colour function “Human Centric Lighting HCL” – Colour temp. source: “1-bit group object Ramp curve (int.)”

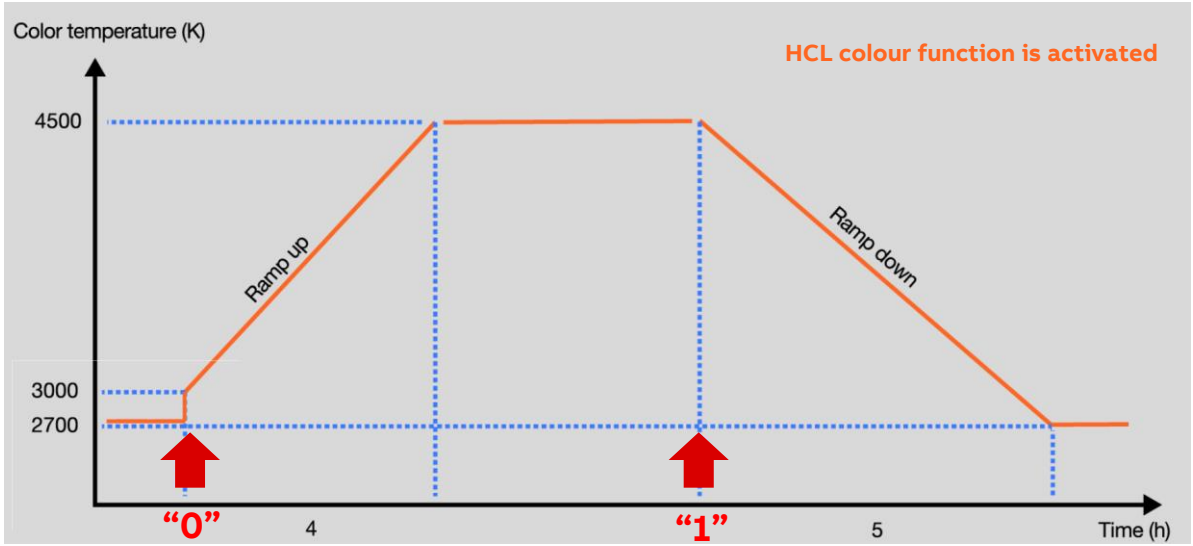
HCL colour temp. source: “1-bit group object Ramp curve (int.)”

The ramp up is triggered by a 1-bit group object, "*HCL ramp up/down*" (value “0”)

- The ramp up starts at a colour temperature of 3,000 K
- After 4 hours, it reaches the setpoint value of 4,500 K (final colour temperature)

The colour temperature value then stays at the setpoint until the "*HCL ramp up/down*" group object triggers the ramp down (value “1”)

- This starts at 4,500 K and after 5 hours, reaches 2,700 K



Nu	Group Address	Name	Object Function	Length	Data Type
63	1/4/63	Output A	HCL ramp up/down	1 bit	up/down

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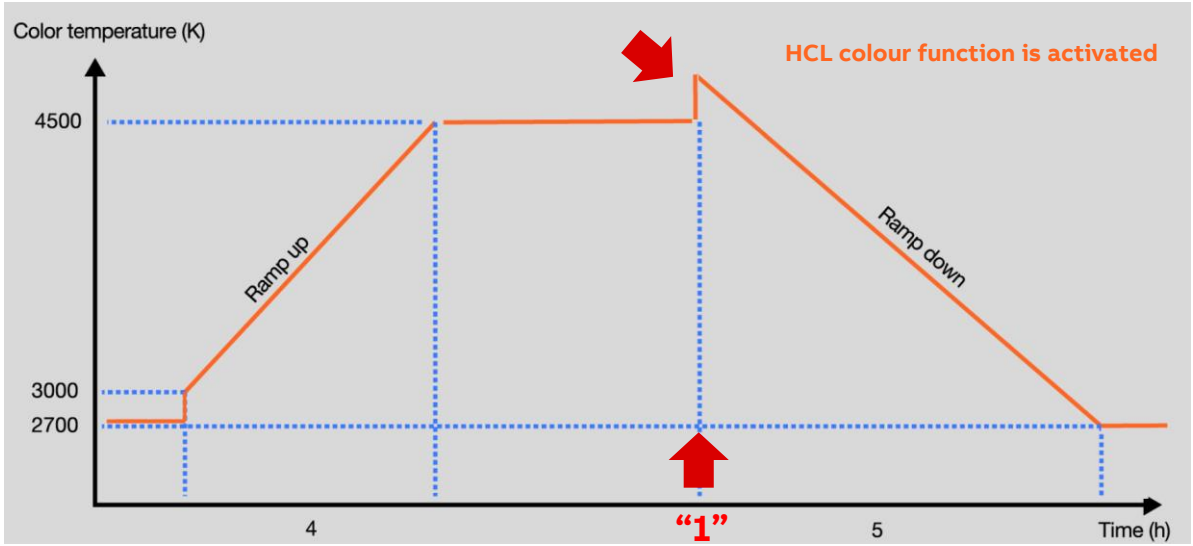
Colour function “Human Centric Lighting HCL” – Colour temp. source: “1-bit group object Ramp curve (int.)”

HCL colour temp. source: “1-bit group object Ramp curve (int.)”

It is also possible to set the start of the falling edge to a different colour temperature value to the one previously set for the end of the ramp up

When the *"HCL ramp up/down*" group object triggers the ramp down, it takes a fixed time of 5 seconds to dim the group/ballast to the colour temperature value set for the start of the ramp down



Nu	Group Address	Name	Object Function	Length	Data Type
63	1/4/63	Output A	HCL ramp up/down	1 bit	up/down

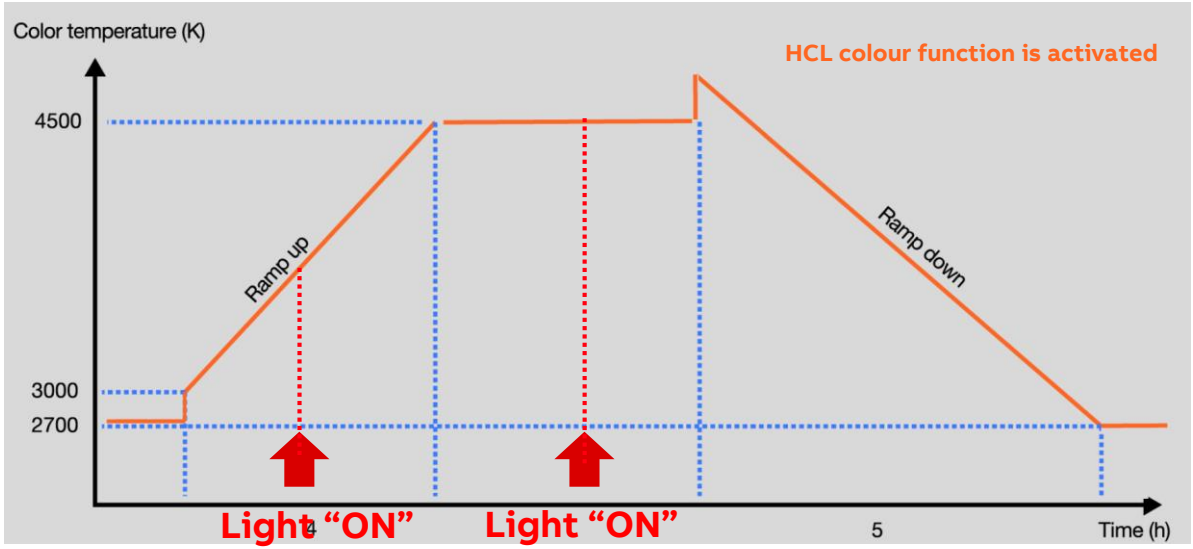
KNX DALI Gateway Premium DG/S x.64.5.1

Colour function “Human Centric Lighting HCL” – Colour temp. source: “1-bit group object Ramp curve (int.)”

HCL colour temp. source: “1-bit group object Ramp curve (int.)”

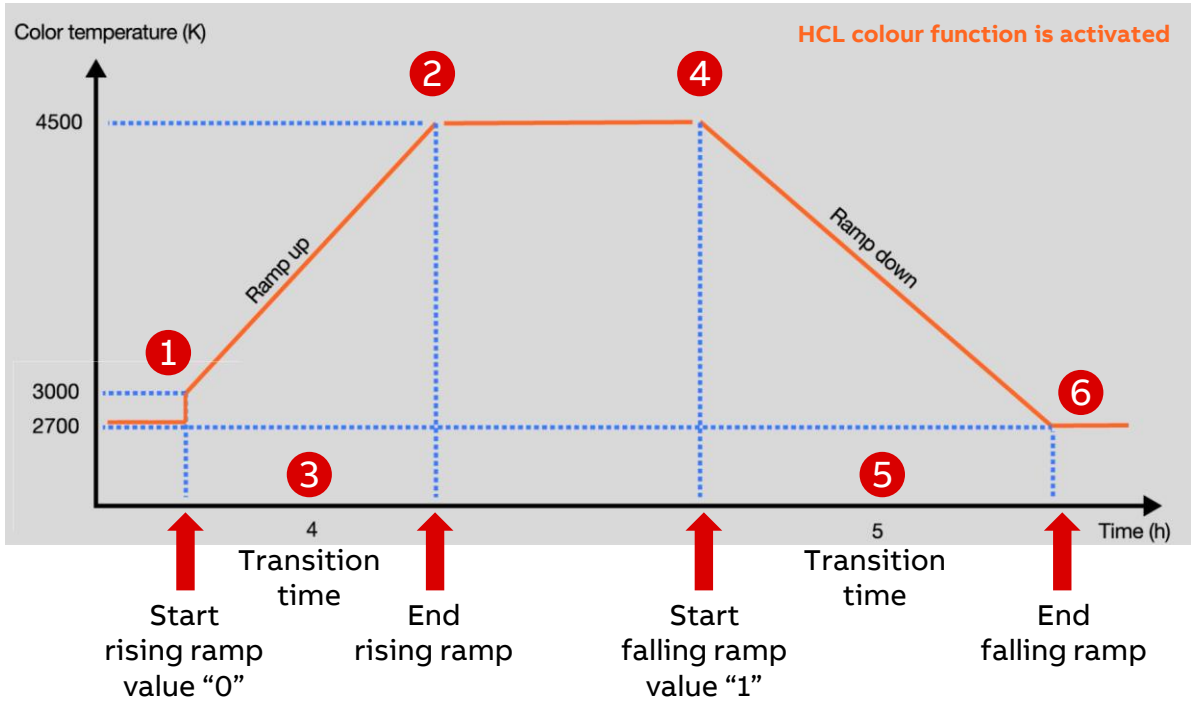
If a group/ballast is switched on while an HCL is activated and the ramp

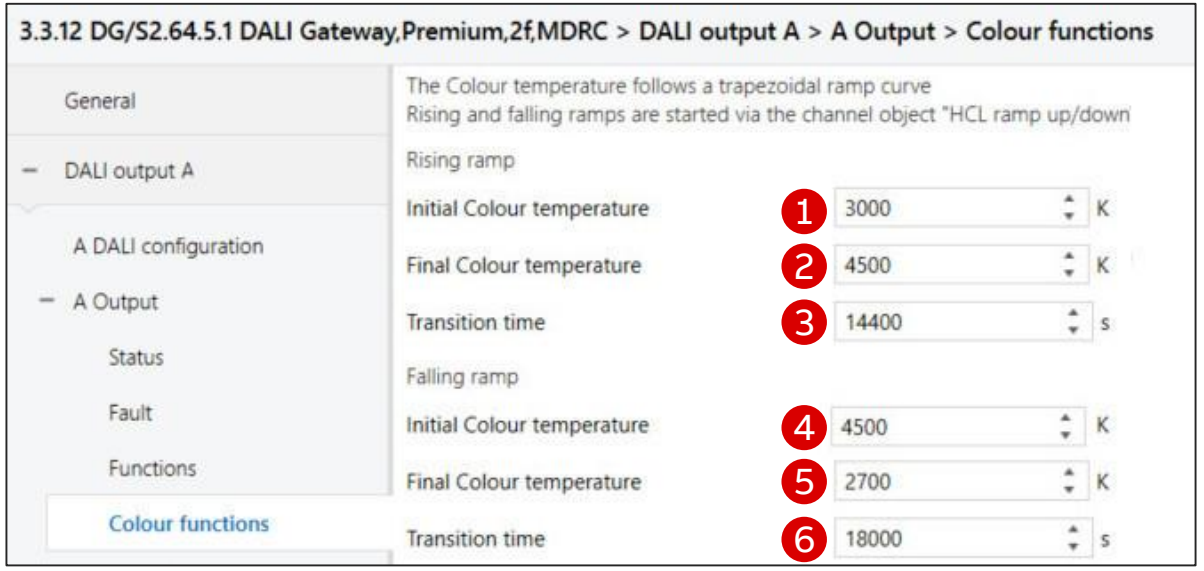
- is running, it will be dimmed to the current colour temperature within 5 seconds
- has expired, the final color temperature is dimmed within 5 seconds



KNX DALI Gateway Premium DG/S x.64.5.1

Colour function “Human Centric Lighting HCL” – Colour temp. source: “1-bit group object Ramp curve (int.)”





Nu	Group Address	Name	Object Function	Length	Data Type
63	1/4/63	Output A	HCL ramp up/down	1 bit	up/down

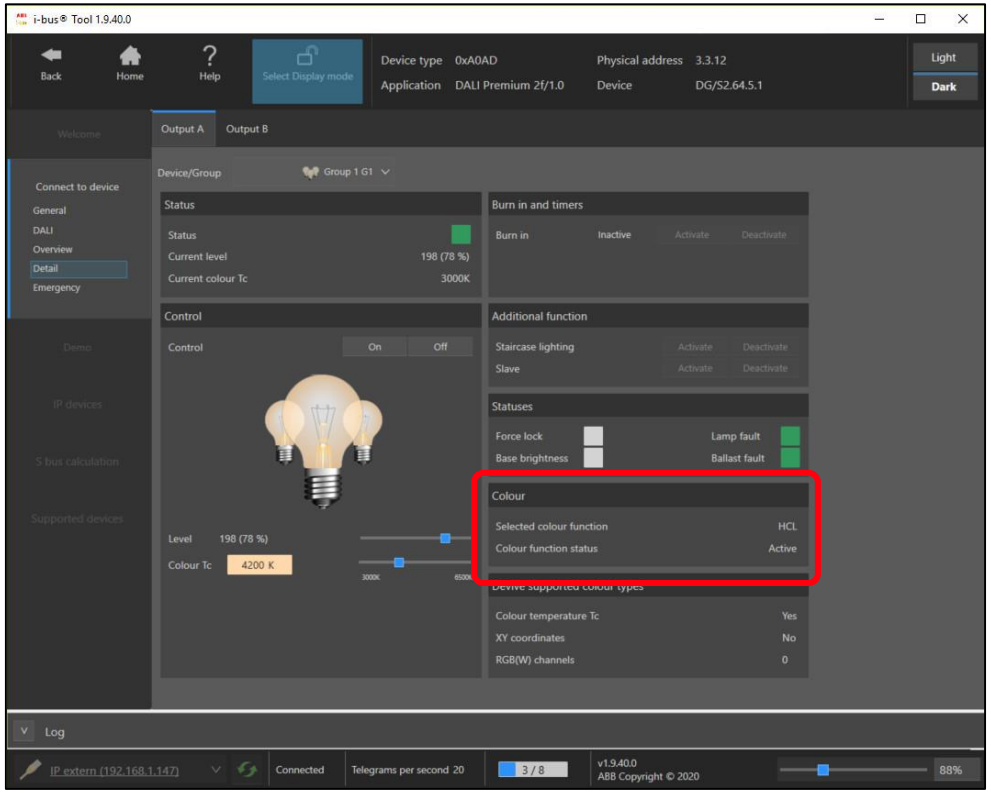
KNX DALI Gateway Premium DG/S x.64.5.1

Colour function “Human Centric Lighting HCL” – Colour temp. source: “1-bit group object Ramp curve (int.)”

ABB i-bus® Tool

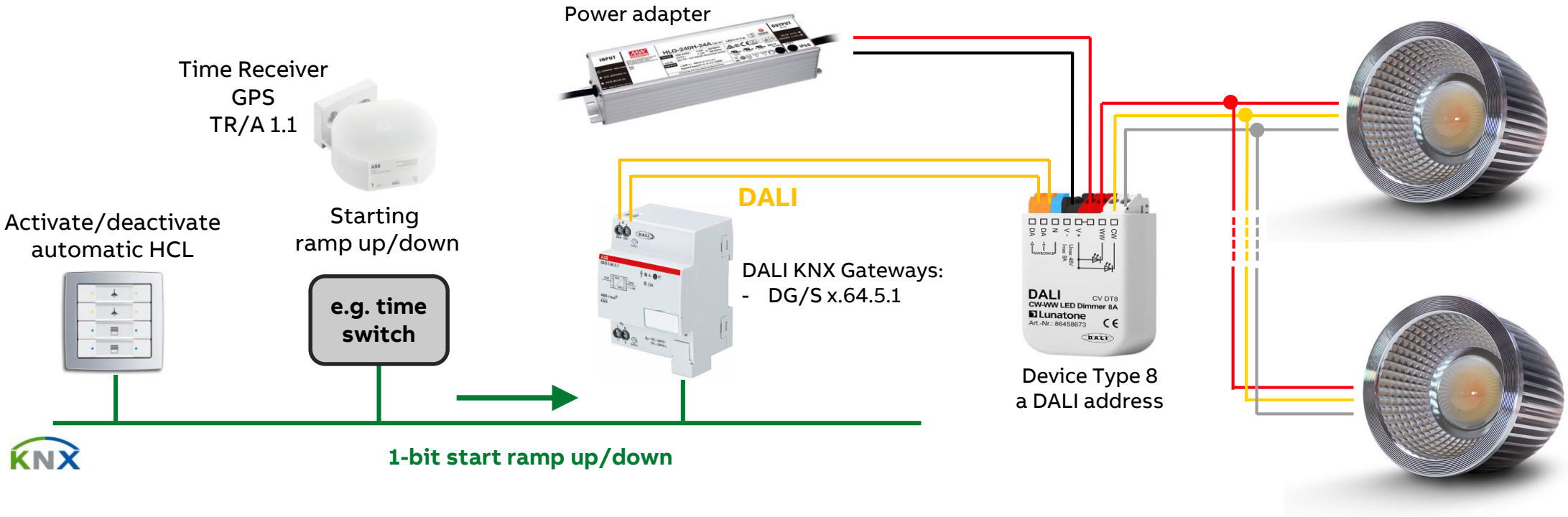
The selected and the state of the Colour function “Human Centric Lighting HCL” is displayed

The prerequisite is that the additional function is parameterized in the ETS



KNX DALI Gateway Premium DG/S x.64.5.1

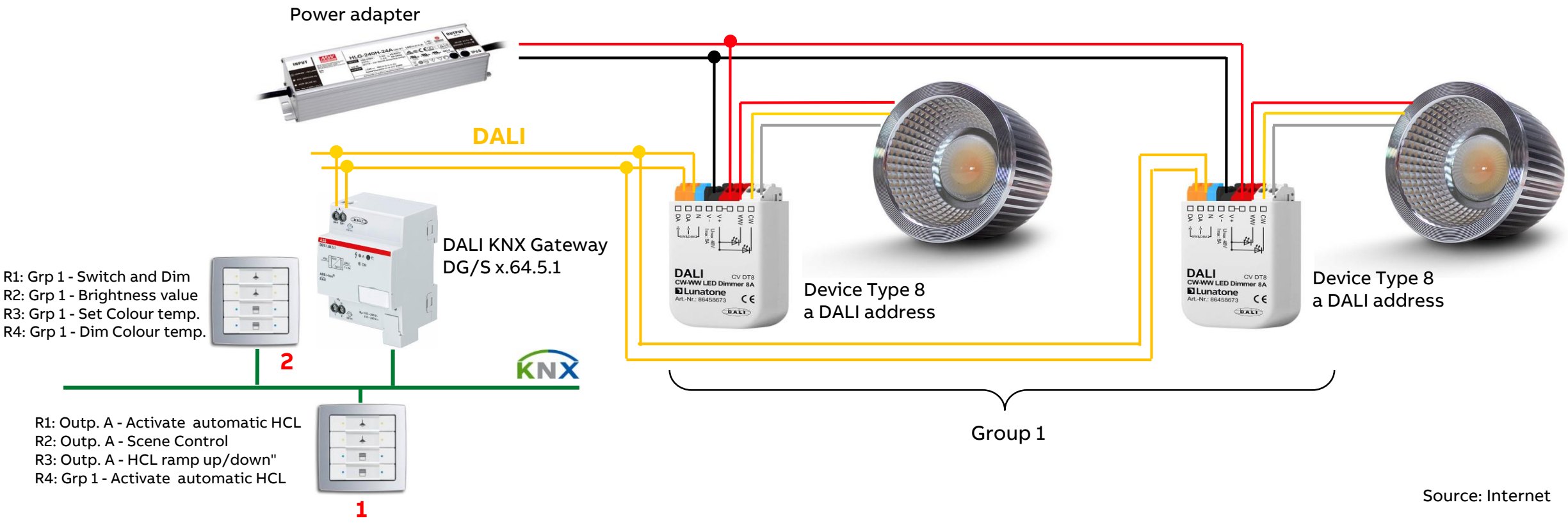
Colour function “Human Centric Lighting HCL” – Colour temp. source: “1-bit group object Ramp curve (int.)”



Source: Internet

KNX DALI Gateway Premium DG/S x.64.5.1

Colour function “Human Centric Lighting HCL” – Colour temp. source: “1-bit group object Ramp curve (int.)”



Source: Internet

KNX DALI Gateway Premium DG/S x.64.5.1

Colour function “Human Centric Lighting HCL” – Colour temp. source: “1-bit group object Ramp curve (int.)”
Example: Assignment of Group Addresses

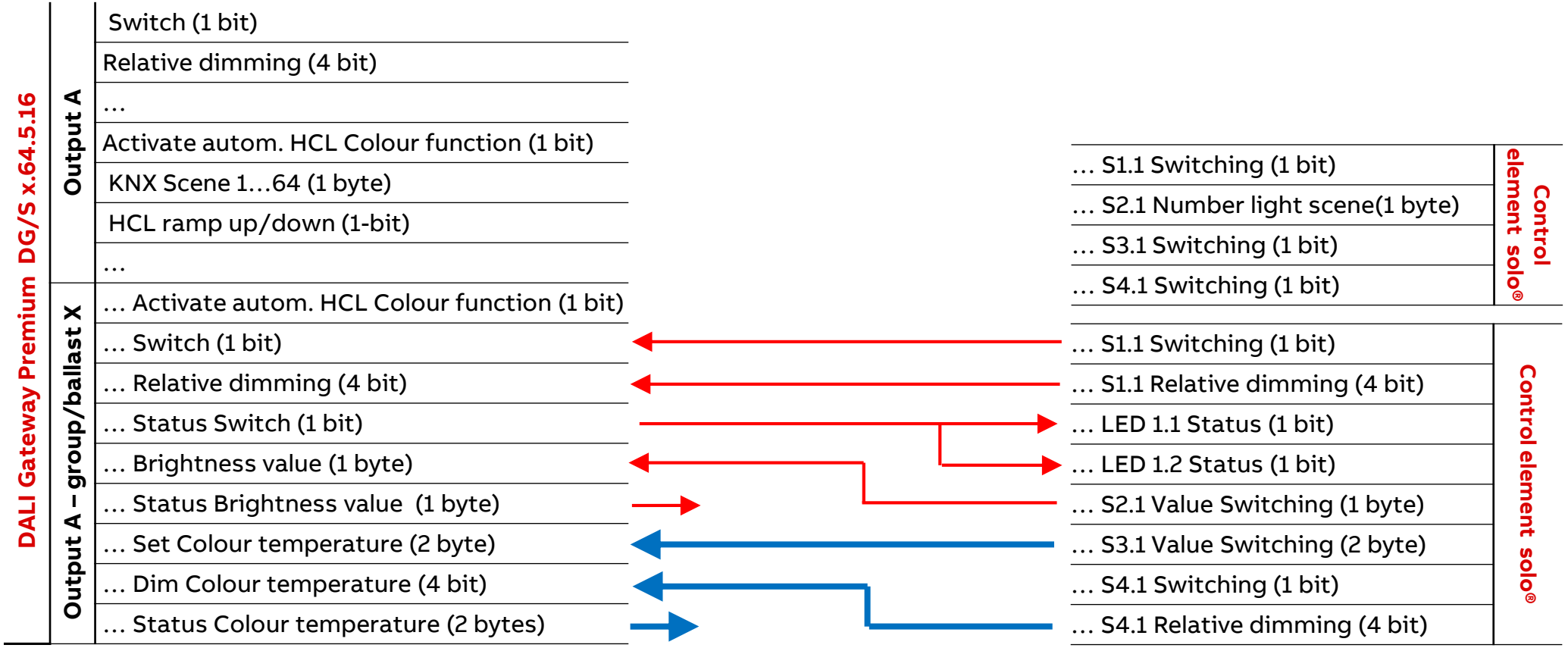
DALI Gateway Premium DG/S x.64.5.16

Output A	Switch (1 bit)
	Relative dimming (4 bit)
	…
	Activate autom. HCL Colour function (1 bit)
	KNX Scene 1…64 (1 byte)
	HCL ramp up/down (1-bit)
	…
Output A – group/ballast X	… Activate autom. HCL Colour function (1 bit)
	… Switch (1 bit)
	… Relative dimming (4 bit)
	… Status Switch (1 bit)
	… Brightness value (1 byte)
	… Status Brightness value (1 byte)
	… Set Colour temperature (2 byte)
	… Dim Colour temperature (4 bit)
	… Status Colour temperature (2 bytes)

Control element solo®	… S1.1 Switching (1 bit)	1
	… S2.1 Number light scene(1 byte)	
	… S3.1 Switching (1 bit)	
	… S4.1 Switching (1 bit)	
Control element solo®	… S1.1 Switching (1 bit)	2
	… S1.1 Relative dimming (4 bit)	
	… LED 1.1 Status (1 bit)	
	… LED 1.2 Status (1 bit)	
	… S2.1 Value Switching (1 byte)	
	… S3.1 Value Switching (2 byte)	
	… S4.1 Switching (1 bit)	
	… S4.1 Relative dimming (4 bit)	

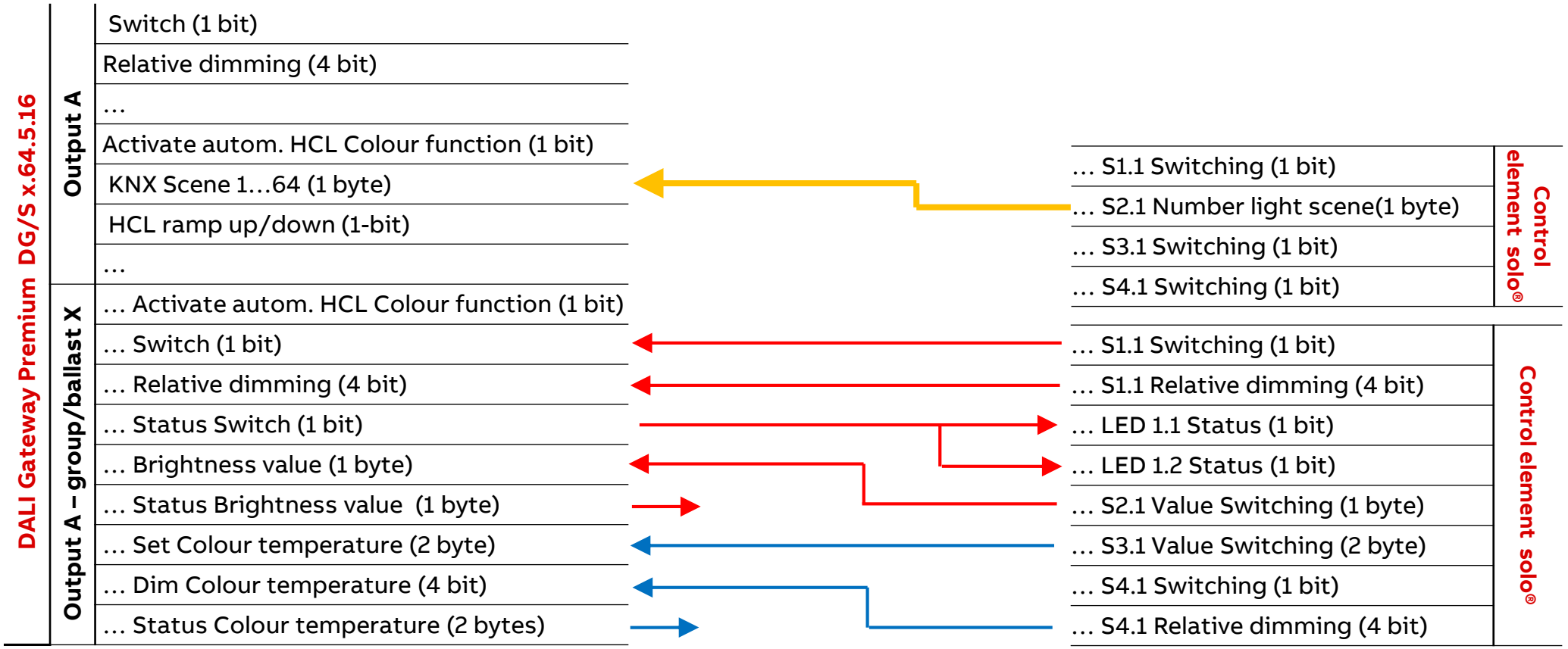
KNX DALI Gateway Premium DG/S x.64.5.1

Colour function “Human Centric Lighting HCL” – Colour temp. source: “1-bit group object Ramp curve (int.)”
Example: Assignment of Group Addresses



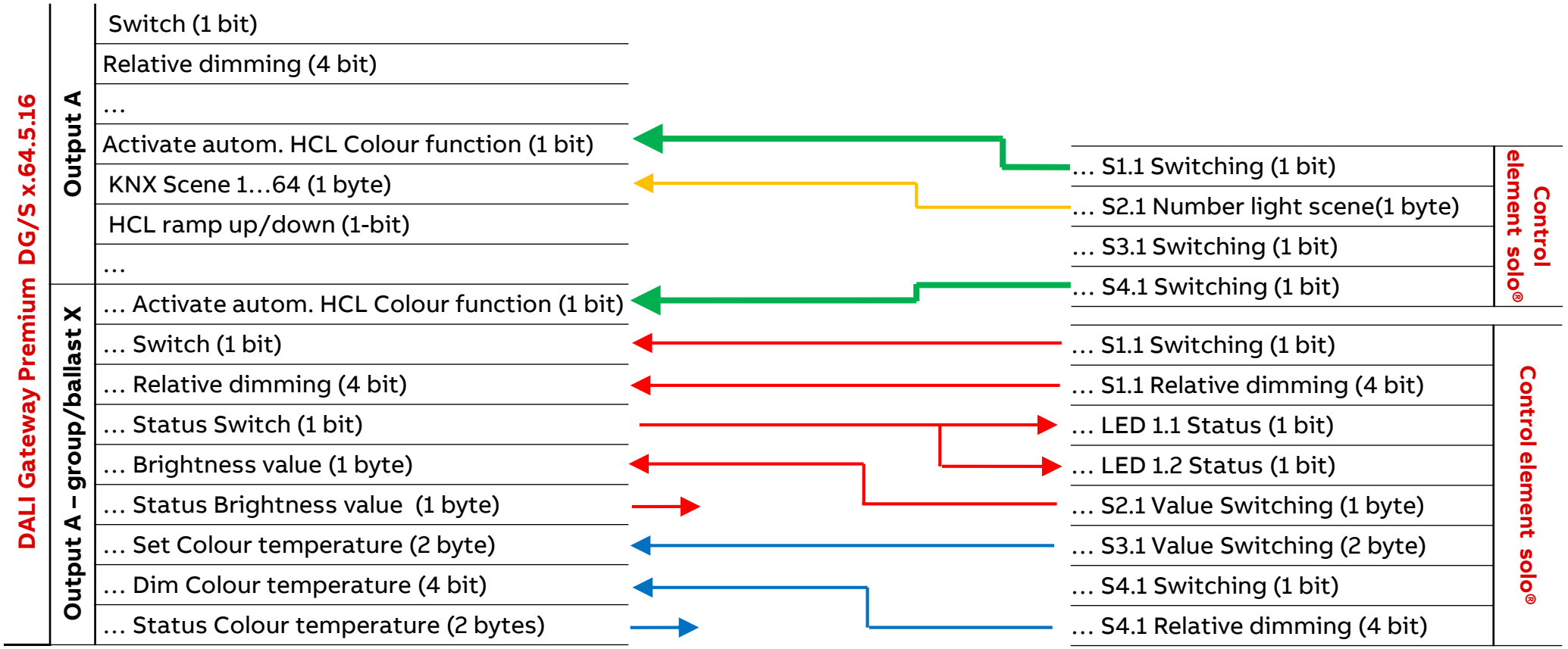
KNX DALI Gateway Premium DG/S x.64.5.1

Colour function “Human Centric Lighting HCL” – Colour temp. source: “1-bit group object Ramp curve (int.)”
Example: Assignment of Group Addresses



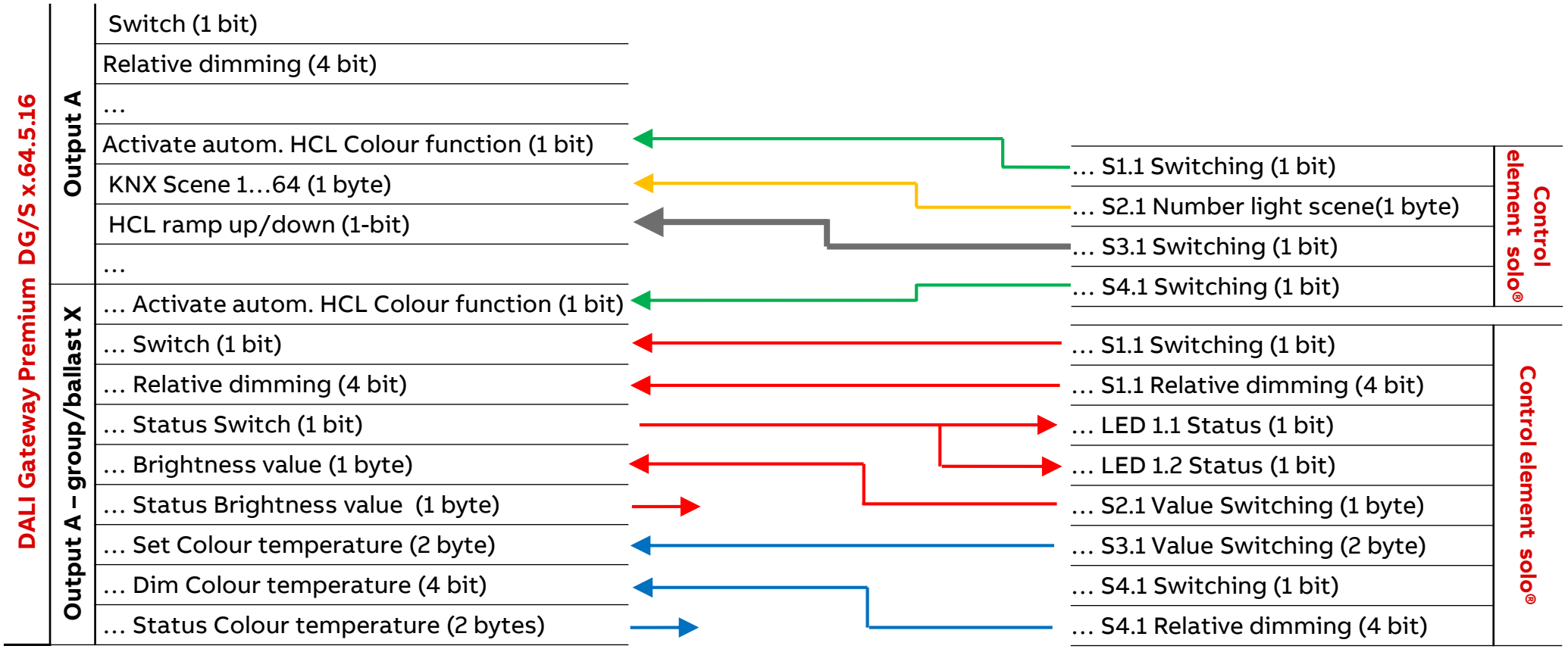
KNX DALI Gateway Premium DG/S x.64.5.1

Colour function “Human Centric Lighting HCL” – Colour temp. source: “1-bit group object Ramp curve (int.)”
Example: Assignment of Group Addresses



KNX DALI Gateway Premium DG/S x.64.5.1

Colour function “Human Centric Lighting HCL” – Colour temp. source: “1-bit group object Ramp curve (int.)”
Example: Assignment of Group Addresses



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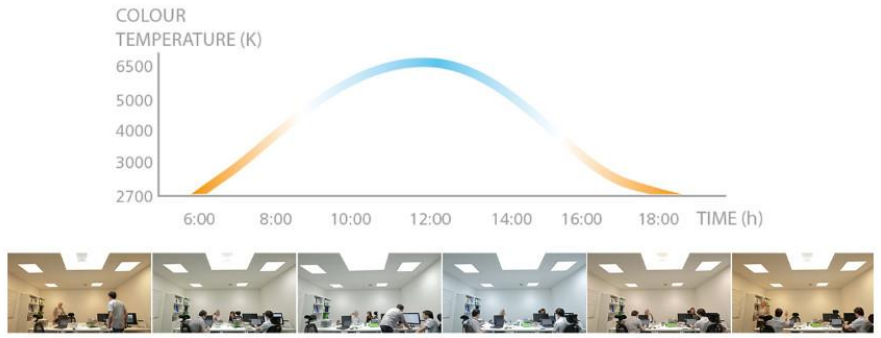
KNX DALI Gateway Premium DG/S x.64.5.1

Colour function “Human Centric Lighting HCL”

Summary

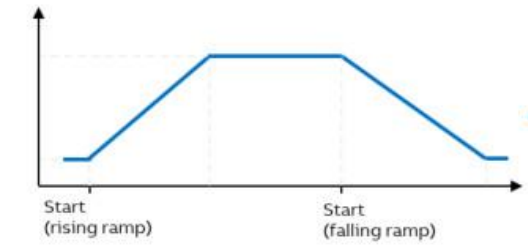
- Human Centric Lighting can adapt people's daily rhythms to one another and increase their motivation, well-being and productivity
- Human Centric Lighting (HCL) simulates the daylight in a building
- HCL only controls the color temperature and has no influence on the brightness (dimming, value)
- HCL colour temperature source:
  - External: A visualization, BMS, … calculates and provides cyclically colour temperature values
  - Internal: Start a parametrizable colour temperature ramp curve (rising and falling ramp)
- HCL can be activated on a group/ballast or central
- The Colour function HCL or Dim2Warm can be used for a group/ ballast
- Ballasts of device type 8 and tunable white LEDs are required



Source: Internet

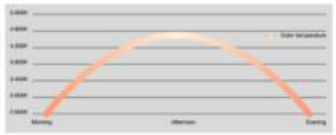
KNX DALI Gateway Premium DG/S x.64.5.1 – “Human Centric Lighting”

Questions



Internal:
Ramp curve

or

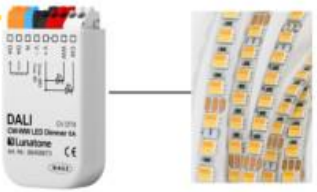


HCL controller

External:
Colour temperature values

HCL colour temperature source

DALI



KNX

e.g. BMS,
visualisation, …

Source: Internet

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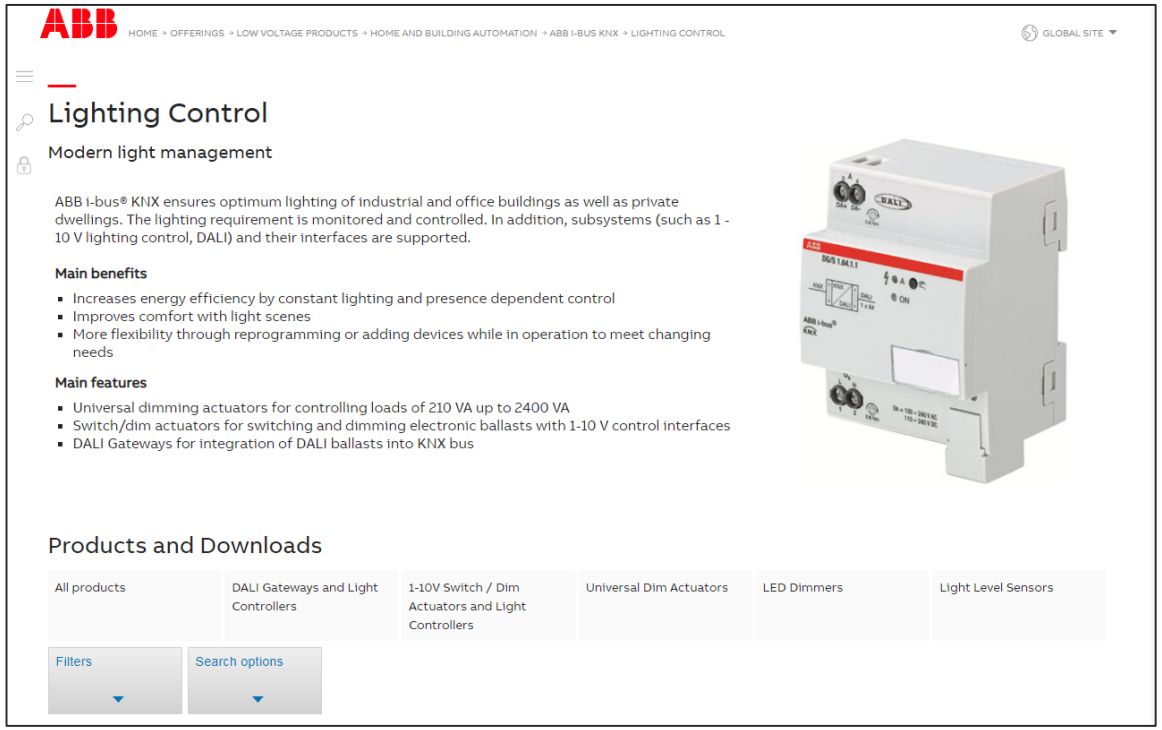
Homepage

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

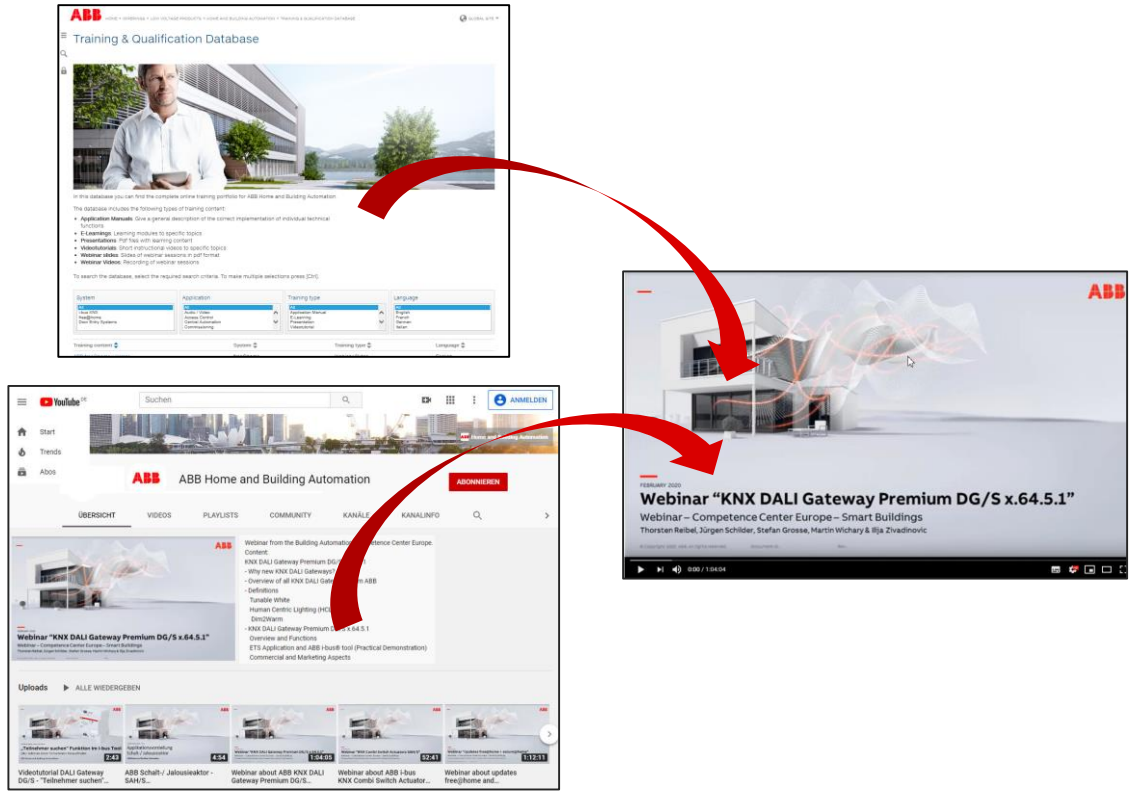
Further information

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

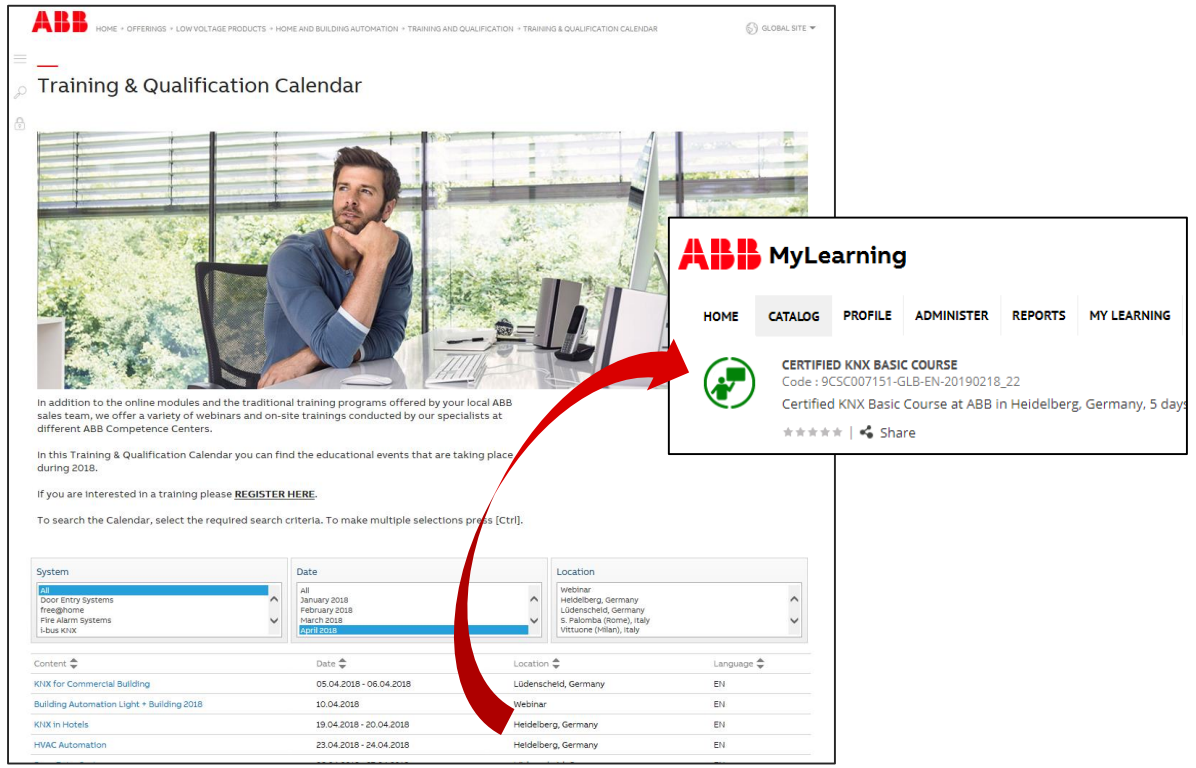
In this Training & Qualification Calendar you can find the educational events that are taking place during 2020

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

KNX DALI Gateway Premium DG/S x.64.5.1 – “Human Centric Lighting”

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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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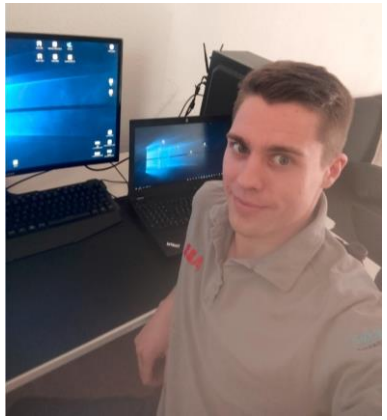
Next online learning sessions

- Thursday 23rd April: KNX ETS5 and group addresses – free-style address structure, export/import, generate group addresses in EXCEL, …
- Tuesday 28th April: ControlTouch – Basic Commissioning (Wizard)
- Thursday 30th April: ControlTouch – Sonos Linking
- 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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