

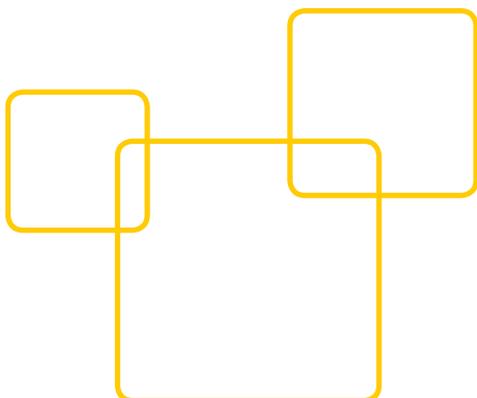


Technical Manual Light Controller LS/LSW

Light Control Gear for Intelligent Indoor Lighting

Light Controller LS/LSW

For Software Version 1.3 or higher





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■ GENERAL

Introduction

Thank you for purchasing the LiCS system made by Vossloh-Schwabe. Before using the product, please read this operating manual to familiarise yourself with LiCS' functions and to make more effective use of the product. When not in use, please keep the manual in a safe place for easy future reference. Anybody who is involved with setting up, commissioning, operating, maintaining and repairing the system must:

- be suitably qualified,
- strictly observe the instructions contained in this manual.

Use of Symbols in the Manual

The following symbols are used in the manual to highlight procedures, limitations, precautionary measures and instructions that must be observed for safety reasons



Marks warnings that, if not observed, can lead to death, injury and property damage. Warnings of this kind must be observed to ensure safe operation of this product.



Marks important information and limitations that must be observed. Please read these points carefully to ensure fault-free operation of the system or of individual components.



Marks additional information regarding system operation and/or the operation of individual components. Reading these notes is recommended.



Marks situations which will require running a check for duplicate addresses.



Abbreviations used in the manual:

- ➔ LiCS = Lighting Control Solutions
- ➔ DALI = Digital Addressable Lighting Interface
- ➔ LL = Light Level

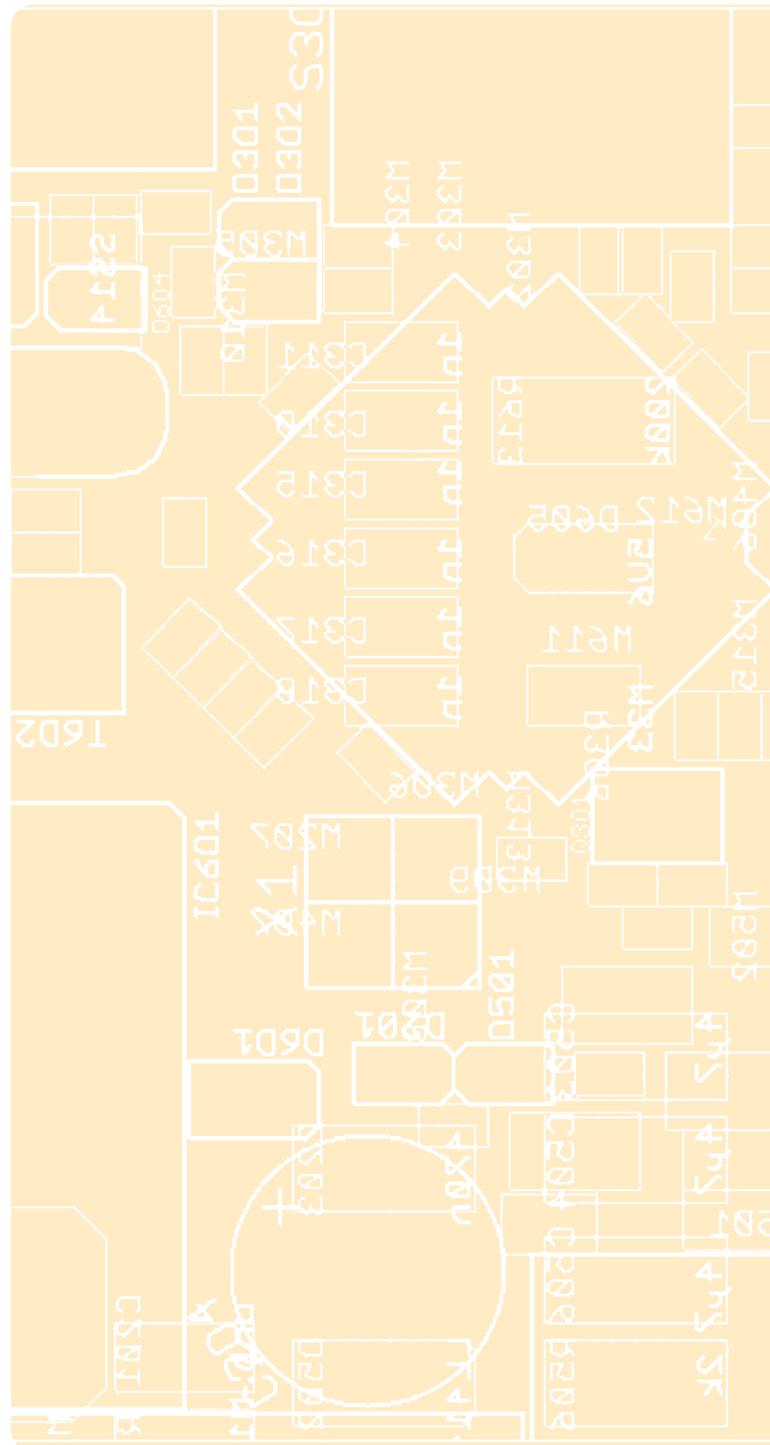
LEGAL NOTES

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LIGHT CONTROLLER LS / LSW

INSTALLATION AND FUNCTION



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■ GENERAL PRODUCT DESCRIPTION

The LS and LSW Light Controllers are light management systems that were developed to enable control and adjustment of lighting systems without requiring connection to a PC or a higher-level bus system.

Communication between the Light Controller and luminaires is based on the standardised DALI protocol. Both Light Controller models comply with all previously adopted parts of the IEC 62386 standard, in line with which a DALI system can have a maximum of 64 addresses. The controllers are designed for mounting on a 35 mm DIN-compliant mounting rail and both feature a display screen plus a rotary push key for easy, PC-free configuration of the entire lighting system. Any subsequently required system modifications can also be carried out in the same way.

Up to six (6) independently configurable standard push buttons can be connected to an LS or LSW Light Controller. In addition, it is possible to connect up to 36 MultiSensors to the DALI bus, in which case the maximum 200 mA current load of the Light Controller's bus must not be exceeded (see DALI current consumption of the individual components). The LSW Light Controller provides the additional option of integrating up to 16 wireless modules, each of which can be fitted with up to 4 individually configurable push buttons.

These Light Controllers are particularly suitable for enabling individual control of systems featuring various luminaire groups. Considerable energy savings can be achieved by combining timers with movement and light sensors.

Additional benefits of the LSW Light Controller by integrating a radio button

- Removes the need for heavy building work (e.g. when performing retrofits / refurbishments or memorial protection work)
- Wireless modules are available as wall-mounted and hand-held versions, which serves to reduce thermal loads.

These product features make the LS/LSW Light Controllers ideal for numerous applications, such as:

- Offices, industrial facilities and warehouses/storage areas
- Supermarkets
- Public buildings (e.g. schools and hospitals)
- Stairwells and hallways
- Sanitary facilities

Installation Notes

Installation



Vossloh-Schwabe LiCS products must be installed and commissioned only by fully qualified staff.



Please read this manual carefully before installing and commissioning the system to ensure its safe and correct operation. Please keep the manual in a safe place for easy reference in the future.

Power Supply



Before performing any work on electrical devices, please ensure they are disconnected from the power supply.



Incorrect opening of LiCS products poses a danger to life due to high voltage, for which reason any such action is not permissible. All repairs must be carried out only by the manufacturer.



The installation instructions for the individual LiCS products must be strictly observed. All valid safety-relevant and accident-prevention directives and laws must also be observed.

■ INSTALLATION OF THE LIGHT CONTROLLER

Please note that the Light Controller is suitable only for mounting on a 35-mm mounting rail (compliant with DIN 43880), which in turn must be installed inside a distribution board and requires 7 HP (125 mm) of space.

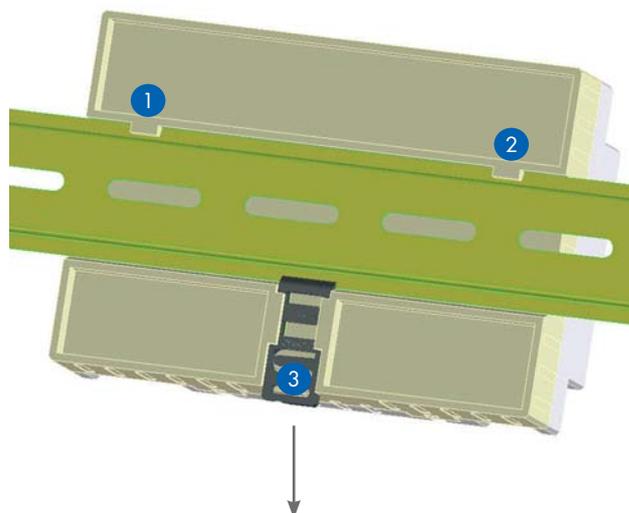
When mounting the Light Controller on the rail, care must be taken to ensure that the display screen is in the upper left corner.

First hook the Light Controller over the upper edge of the rail using the two mounting notches ① and ② to help you.

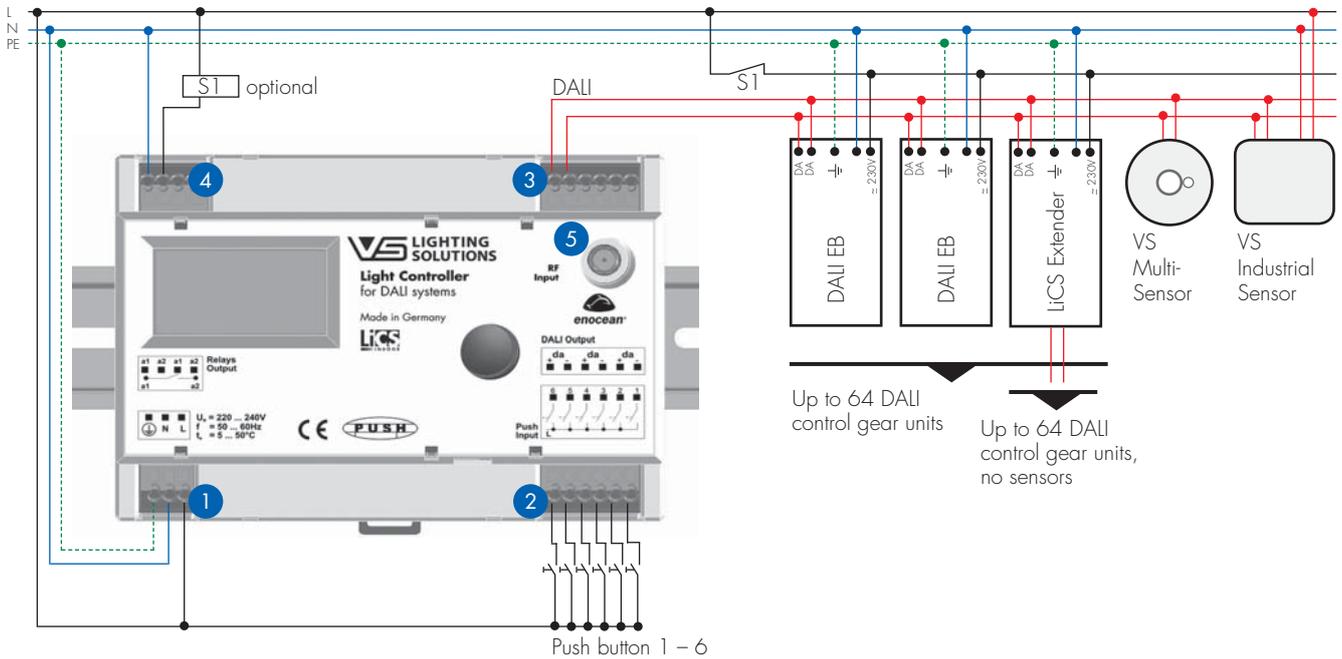
Then carefully press the Light Controller down over the lower edge of the rail until the controller's mounting spring ③ slides over the lower edge of the rail and snaps into place.

If necessary, use a screwdriver to ease the spring into place.

To remove the Light Controller from the rail, use a screwdriver to draw the controller's mounting spring out in the direction of the arrow and then lift the device from below



CIRCUIT DIAGRAM



CONNECTION TERMINALS

1 – 4

The integrated connection terminals can be wired using either rigid or flexible conductors with a cross-section of 0.5-1.5 mm² and a stripped end length of 8.5-9.5 mm.

1

The Light Controller is a protection class I device. It is therefore essential to ensure the protective earth (PE) is properly connected. The voltage terminals are designed for use with 220-240 V, 50/60 Hz mains power. DC operation is not possible. The equipment must be fitted with a 10 A or 16 A, Type B automatic circuit breaker.

2

Commonly available push buttons can be connected to terminals 1 to 6. As these push buttons will also be connected to mains voltage, they must be sufficiently voltage proof. If necessary, several push buttons can be connected in parallel to a single terminal that, when activated, will each perform the same function. A maximum cable length of 100 m per push button must not be exceeded.

3

By default, the DALI bus is delivered with basic insulation only. All DALI lines must therefore be mains voltage-proof, but can be wired to individual devices together with the mains conductor, e.g. NYM 5 x 1.5 mm². The controller's DALI bus input is fitted with three pairs of terminals, which facilitate the connection of various components (e.g. DALI control gear, MultiSensors). In total, the given number of control gear devices and MultiSensors can be connected to these three terminal pairs. In this regard, the

maximum 200 mA current load of the Light Controller bus must not be exceeded (see DALI current consumption of the individual components)

Please refer to the table at the end of the manual for details of the maximum number of DALI components for a Light Controller (see pages 46 to 47).

Please ensure the maximum length of the DALI bus is not exceeded during installation.

Conductor Cross-section	Max. DALI Bus Length
1.5 mm ²	max. 300 m
1 mm ²	max. 180 m
0.75 mm ²	max. 130 m
0.5 mm ²	max. 80 m

Total conductor resistance must not exceed a value of 6.2 Ω. If the mains power conductor and the DALI conductor are to be laid together in a single cable, this must not exceed a length of 100 m regardless of the cross-section.



No DALI control gear or DALI bus supply units made by other manufacturers may be connected to a LiCS DALI system. Only DALI control gear and LiCS MultiSensors may be connected. On no account may mains voltage or any other external voltage be applied to the DALI control line as this could lead to the destruction of individual system components.

4

The relay contact is a potential-free closing contact. The current load of the contact must not exceed an Ohmic load of $I_{max} = 3 \text{ A}$. When using the contact to minimise standby losses, an additional external contactor must be used.

5

Although both models of the Light Controller feature an antenna-connection jack (located top right on the front), the jack on the LS Light Controller is without function. The one found on the LSW Light Controller, which provides the option of integrating wireless components, lets you connect an antenna to ensure full use can be made of the components' wireless range.

Depending on the type of distribution board and the respective application, VS provides the antenna in two versions: one with a magnetic base and one with a base for permanent mounting. This antenna is not included in the scope of delivery (see the chapter on "Antenna for the LSW Light Controller" on page 8).



IMPORTANT

Wireless components within the LiCS system communicate using EnOcean technology, which operates at a frequency of 868 MHz. Given unfavourable conditions (e.g. spatial interference from other wireless systems), no guarantee can be given that the EnOcean technology will remain unaffected. Similarly, no guarantee can be given that the EnOcean technology will not affect other systems, either.



INFO

The integrated EnOcean technology is approved for use within the EU, Switzerland, Norway and Iceland. Please contact your Vossloh-Schwabe representative in advance of using the technology in any other countries.



enocean®

■ ANTENNA FOR THE LSW LIGHT CONTROLLER

To ensure fault-free wireless operation, an antenna is required that works with the respective frequency. This antenna is available in two models: as an antenna with a screw base and a separate connection cable (length: 1.5 m) or alternatively as an antenna with a magnetic base and an integrated connection cable (length: 2.5 m).

To ensure optimum signal reception, care must be taken when fitting the antenna that it is not shielded by metal objects such as steel cabinets, radiators, ventilation shafts, etc..

Installation Instructions and Technical Details:

See manufacturer's datasheet.

- Magnetic-base antenna with integrated connection cable
Ref. No. 186211
- Screw-base antenna
Ref. No. 186212
- Connection cable for screw-base antenna
Ref. No. 186213



■ RADIO BUTTON WITH ENOCEAN TECHNOLOGY FOR THE LSW LIGHT CONTROLLER



Furthermore, we can also provide a number of different radio buttons, about which you can find further information on page 45. However, there are also other manufacturers of radio buttons featuring EnOcean technology on the market.

Please observe the installation instructions and datasheets of the respective manufacturers when installing such components.

Please note that only wireless modules that work with a frequency of 868 MHz can be used.

For range planning purposes of EnOcean technology, also see: www.enocean.com/fileadmin/redaktion/pdf/app_notes/AN001_RANGE_PLANNING_Sep10_en.pdf

FUNCTIONS

■ CONTROLLER BEHAVIOUR DURING COMMISSIONING (DEFAULT SETTINGS)

When the system is first connected to mains power after it has been fully installed, the Light Controller will – following a short warm-up time (<5 seconds) – switch all devices within the system “OFF”.



To this end, a push button must be connected to PB input 1 (as shown in the circuit diagram on page 6), which has been preconfigured for push-button connection. Once the system has been configured, the push button can be reset to perform a different function.

If the set time is invalid, the start screen will display a “Clock Error” status. The rotary push key can be used to set the time.

Even without immediately configuring the system, all connected luminaires can be jointly switched ON or OFF.

The mains power supply of the controller can also be used to switch the system on and off.

On disconnection from mains power, all DALI system devices will enter “System Failure Level” status at a default light level of 100%.

■ COMPONENT INTEGRATION AND ASSIGNMENT

This section is designed to explain system responses and functions. The exact configuration procedure can be found in the "System Configuration" chapter starting on page 18.

Integrating Components into the System (Menu item: "Hardware Search")

After the system has first been switched on and after possibly setting the time and date, yet prior to configuration, the Light Controller needs to know which devices (luminaires, sensors, buttons) are connected to the system. To this end, the LS/LSW Light Controllers feature a "Hardware Search" menu item. This menu item is used to integrate system devices (luminaires, sensors, buttons) either with the help of the automatic search function or a menu for enabling standard push buttons. The LSW Light Controller features an additional manual search option for wireless modules.

The controller will recognise all system devices and assign a short address to each:

- luminaire 1 to luminaire 64
- sensor 1 to sensor 36
- push button 1 to push button 6

Additionally for the LSW Light Controller:

- radio button 1/1 to 1/4 to radio button 16/1 to 16/4



INFO

Luminaire and sensor addresses are randomly assigned. It is therefore recommended to make a note of the respective addresses in the lighting plan when groups are formed and sensors configured.

You can now continue with the further configuration of the system components.

Forming Luminaire Groups (Menu items: "Group Settings A" and "Group Settings B")

If several luminaires are to respond to a certain control signal collectively, it makes sense to assign these luminaires to a group. A single Light Controller can be used to manage up to 16 groups. The number of luminaires in each group can be freely selected, as long as a total number of 64 luminaires for the entire system is not exceeded.

It is also possible to assign a single luminaire to several groups. However, please note that this can lead to overlapping signals and result in contradictory circuit and dimming responses.

If an individual luminaire is to be addressed with a particular control component, the respective luminaire can also be assigned to said control component by using its short address (luminaire 1 ... luminaire 64) without having to form a group.

In a similar vein, it is also possible to set control components to manage all luminaires in the system collectively, for which a group does not need to be formed, either

Group Settings A

This menu item lets you select each luminaire individually and assign it to a group by turning the rotary push key.



INFO

The shown luminaire address should now be entered in the lighting plan to ensure the address can be clearly allocated to the specific luminaire location at a later date

The marked luminaire will then be integrated into the selected group by pressing the rotary push key

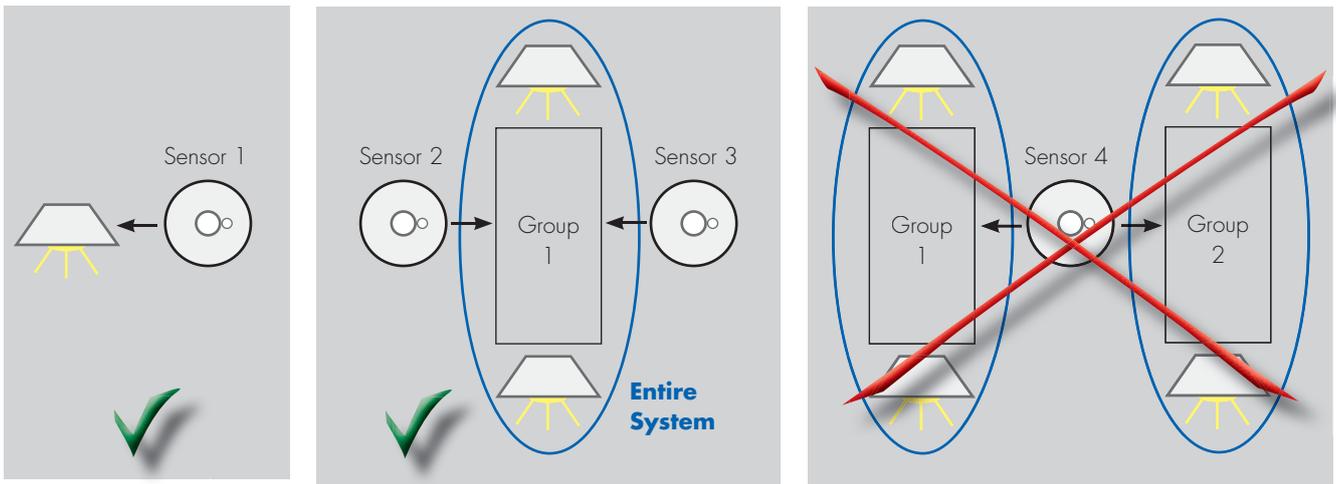
Group Settings B

This menu item lets you assign a luminaire to several groups and will immediately display to which groups the luminaire has been assigned.

Assigning Control Components (Sensors, Push Buttons) to Luminaires (Menu items: Config. Sensor, Config. PB, Config. RB)

The configuration of sensors and push buttons begins with defining the system segment you want to work on. Each control component is assigned an individual address, a group or the entire system.

Although it is not possible to assign a single control component to more than one group, it is possible for two control components to manage a single group.



PUSH BUTTON AND SENSOR FUNCTIONS

The Light Controller can be used to assign different functions to control components. To this end, corresponding menu items must be called up on the display screen.

Push Buttons (Menu items: Config. PB and Config. RB)

After selecting menu item Config. PB or Config. RB, it is possible to assign various functions to the activated push buttons:

1. Push

The push function is a combined ON-OFF-DIM function. A short press of the button switches the respective luminaires ON or OFF. A longer press of the push button will dim luminaires up or down

➤ Short press of the button (80 ms < t < 460 ms)

A short press of the push button alternately switches the lighting on or off. The last activated light level will be restored when the system is next switched on.

➤ Long press of the button (t > 460 ms)

Changes the current light level. After the push button is released, the dimming direction will reverse so that the next press of the push button will dim the system in the opposite direction. Once the upper or lower light level has been reached the dimming process will stop. A long press of the button after powering the system up will always cause the luminaires to dim up.

A long press of the button when the system is switched off will switch the luminaires on and dim them up.

2. Timer Function (Time A)

Once configured to perform a timer function, pressing the button will switch the lighting on at 100%, while a previously defined countdown of between 10 seconds and 90 minutes will be activated in the Light Controller. After the selected countdown has run down, the lighting will be switched off. Pressing the button again during the countdown period will start the countdown anew.

➤ Additional Timer Functions



As a simple "100% On/Off" function is insufficient for certain applications, light levels for switching the system on and off can be defined in the "Light Level" menu item. An additional countdown can also be activated (see "Setting Light Levels" on pages 12 and 13 for further details).

3. ON/OFF

When the system is in ON/OFF mode, pressing the button will alternately switch the system on and off, but will not let you change the light level.

4. Sensor Activation

Given a sensor/push button combination in a group, performing a push or ON/OFF function will deactivate the sensor. With the help of the sensor push button function, the sensor of the associated group can now be activated again, irrespective of the previous status of the group and sensor.

5. Central Push Button

When the push button is pressed, all luminaires – regardless of whether they are grouped or not – will be switched off (set to the lowest dimming level of 0%). The full complement of luminaire functions will only be activated after the push button is pressed again.



Once a light sensor has been assigned to a group, this group will be activated at the lowest dimming setting. After that, the sensor will take over all further controls

Sensors (Menu item: "Config. Sensor")

VS MultiSensors are fitted with both a movement and a light sensor. After the sensors have been integrated into the system, both functions can be separately activated or deactivated in the Light Controller. The default setting for both sensors is inactive.



The sensor shown on the controller's display screen can be identified in the system by the flashing red LED. The shown address should now be entered in the lighting plan to ensure the sensor address can be clearly allocated to the specific installation location at a later date.

Movement Sensor

The sensor can be activated in one of two modes:

➤ ON/OFF Mode (Automatic)

If the sensor detects movement, the lighting will be switched on at 100% and a countdown will be started. Each new detection within the countdown period will then start the countdown anew. Once the countdown has run down (time can be set between 10 seconds and 90 minutes), lighting will be switched off.

➤ OFF Mode (Semi-automatic)

The sensor will not switch the lighting system on if movement is detected. The lighting system has to be switched on manually, e.g. by pressing a push button. Following that, the sensor will have to detect movement to activate a countdown. Each new detection within the countdown period will start the countdown anew. Once the countdown has run down (time can be set between 10 seconds and 90 minutes), lighting will be switched off.

➤ Additional Timer Functions



As a simple "100% ON/OFF" function is insufficient for certain applications, the "Light Level" menu item lets you define light levels for switching the system on or off. Equally, an additional countdown can be activated (see "Setting Light Levels" on pages 12 and 13.)

Light Sensor

A light sensor serves to keep light at a constant level in a room or at a workplace, to which end the light intensity is measured and the level adjusted by adding or removing artificial light in the presence of either too little or too much natural light. The limits are constituted by the system's upper and lower light levels. Should the measured light intensity still be too high upon reaching the basic lighting level, the luminaires of the respective group will be switched off after a waiting period of approx. 1 minute. The required light level must be checked at relevant spots in the room with the help of lux meters. The required light level (consisting of artificial and natural light) is then achieved by dimming artificial lighting up or down.



Ideally, the target light value should be set without the influence of external light (i.e. after sundown) to obtain a reliable reference value. If the connected sensor does not feature an integrated light or movement sensor, this function should not be activated.

Configuring Light Levels (Menu item: System response)

Simply being able to switch the lighting system on or off is insufficient for certain applications. The "System Response" menu item lets you define light levels other than 100% and 0%. Equally, a further countdown period (Time B) can be activated.

Function and Configuration Options for Light Levels

There are three general options:

➤ Active Light Level

"Luminaire", "Group" or "All" remain at the active light level during the countdown of Time A and as long as neither Time A nor Time B has been activated. If the push button or sensor is activated during this period, Time A will start anew and the light level will remain unchanged. After Time A has run down, the "Luminaire", "Group" or "All" will be switched to "Passive LL"

➤ Passive Light Level

This option describes the light level after Time A has elapsed and up to when Time 2 (Time B) comes to an end. No sudden events are expected during this time, but if something does happen during this time, Time B will be aborted and Time A started anew. The light level will be reset to "Active LL". Time B cannot be started anew.

➤ Basic Light Level

This option describes the light level after Time B has run down. No further events are expected during this period (rest mode). If an event does occur during this period, Time A will be started anew. The light level will be reset to "Active LL".

Possible settings for all light levels:

0%, 3% – 100%

Possible settings for Time A (given the respective (radio) push button or sensor configuration):

10 s, 15 s, 30 s, 45 s, 1 min, 2 min, 5 min, 8 min, 10 min, 15 min, 20 min, 30 min, 60 min, 90 min

Possible settings for Time B:

0 s, 5 s, 15 s, 1 min, 2 min, 5 min, 8 min, 10 min, 15 min, 20 min, 30 min, 60 min, 90 min

Default settings:

Active Light Level = 100%, Time A = 30 s

Passive Light Level = 0%, Time B = 0 min.

Basic Light Level = 0%

A so-called "Time A Start Event" can be brought about in one of several ways:

1. Using the Sensor

1. ON/OFF mode: sensor-based movement detection.

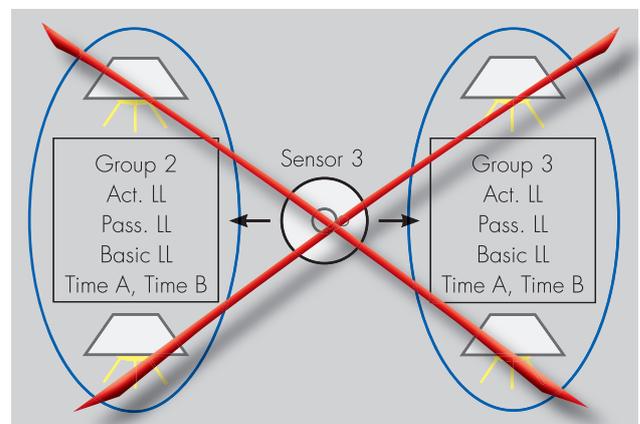
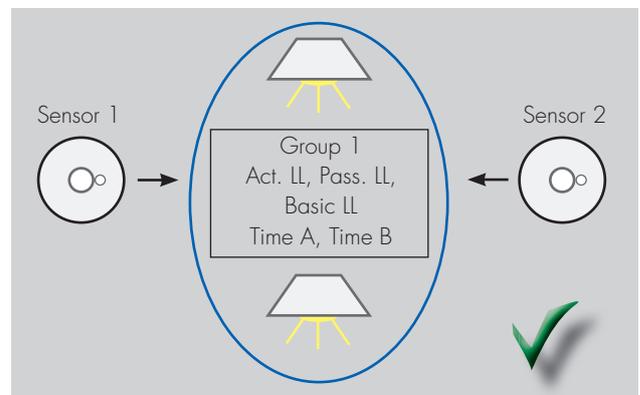
2. OFF mode: a press of the button if in push or ON/OFF mode, followed by movement detection.

2. Using the Push Button

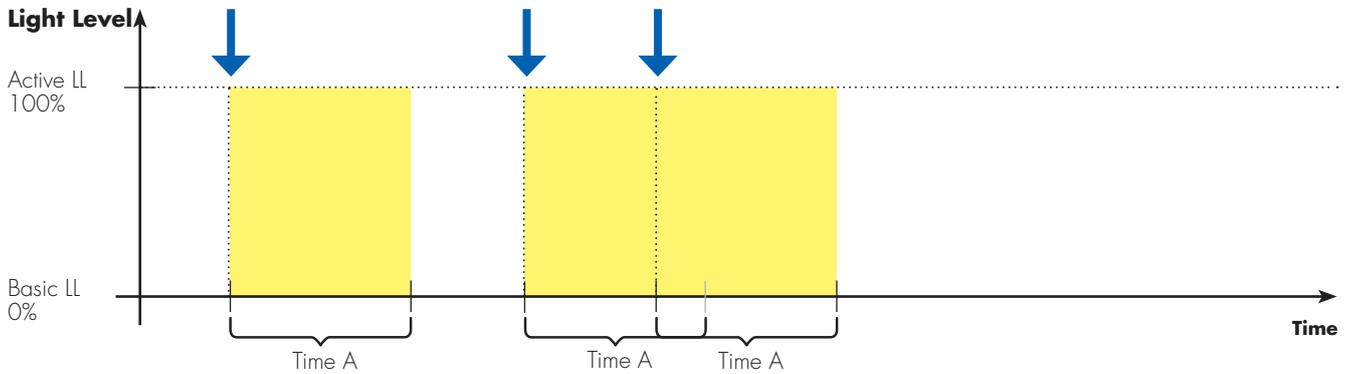
Timer mode, press of the push button.



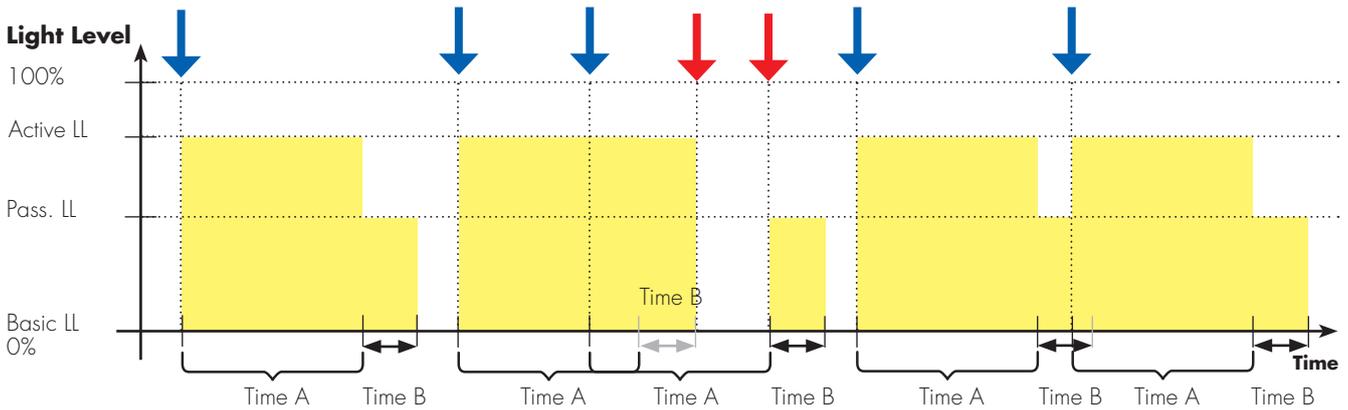
The light level (LL) and time parameters mentioned in the text on the left are not sensor- or push-button-specific. These parameters are much rather saved as group values or as individual address values. This means that, should several sensors and/or timer buttons have been configured for a group/individual address or for all, the same light level and times will be activated with all sensors and/or timer push buttons.



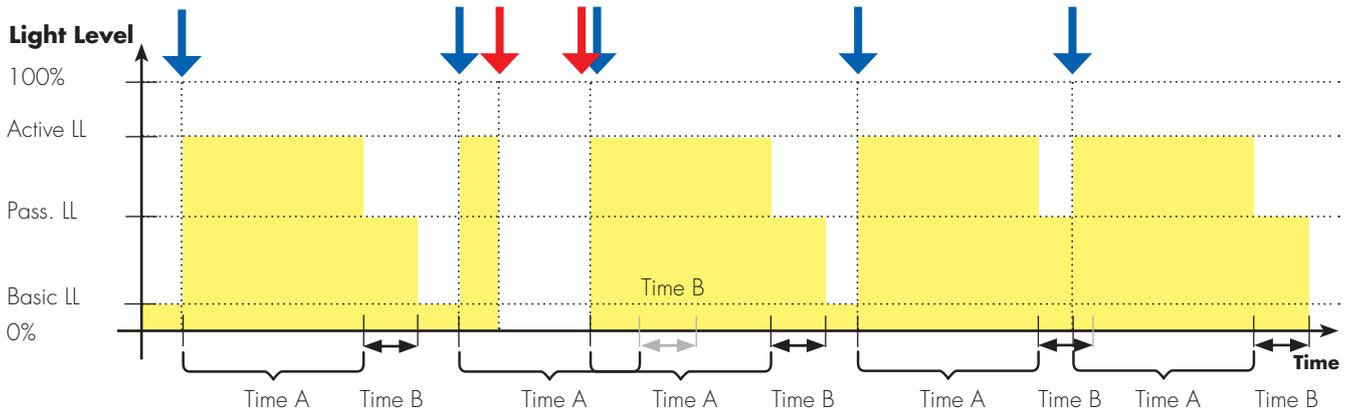
Example: Default Settings



Example with Active LL, Passive LL, Basic LL = 0, Time A and Time B and Power Failure = Light on (Active LL)



Example with Active LL, Passive LL, Basic LL, Time A and Time B and Power Failure = Light off



↓ = t_A , Start event triggered by sensor or push button

↓ = Duration of the power failure

Power failure: the lighting can be set to the following values after a power failure: ON – (Active LL), OFF, Time A (Active LL) followed by OFF

Configuration of Sequences (Menu item: Config. Sequence)

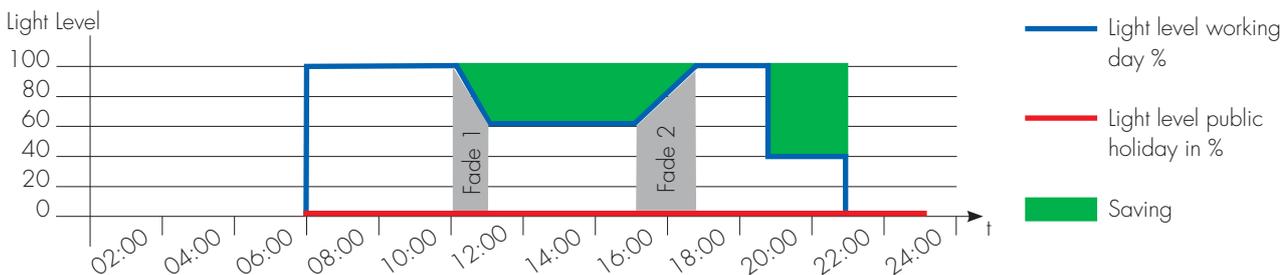
Various light sequences can be configured with the help of defined light fades for weekdays, public holidays and special days for each luminaire group. Up to 16 light sequences can be called up, each of which consists of up to 16 switching times along with the respective luminance values and fade times.

- Convenient: less need to switch the system on manually
- Smooth transitions thanks to configurable fade times (see table).

Fade (DALI)	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Time (s)	0	0.7	1	1.4	2	2.8	4	5.7	8	11.3	16	22.6	32	45.3	64	90.5

- Hardcoded data concerning public holidays in many countries
- Changing the clocks (standard to daylight-saving time and vice versa) stored for each country
- See table in the appendix for a list of countries and their public holidays
- Can be personalised by adding special days
- Ability to call up an individual overview of the current assignment of sequences to the respective days for each group
- After a power failure, the system will restart and the time-dependent light level will be activated.

Example of an Application



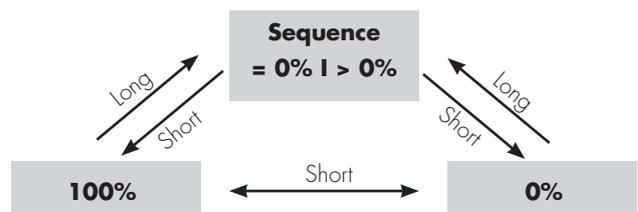
Any group of luminaires with a sequence function cannot be assigned to any sensor (regardless of its function).

IMPORTANT

If a group of luminaires with a sequence function is assigned to a push button, pressing the button will interrupt the sequence and perform the desired push button function.

■ COMBINATION OF SEQUENCE AND PUSH BUTTON

If a group is saved with a sequence, this can be combined with a push button defined to work with this group. Giving the push button a "short" press (<500 ms) will switch to ON/OFF mode (0% or 100%), dependent on the last dim setting ("=0%" or ">0%") of the sequence. Further short presses of the button (<500 ms) will then switch between the two states. A "long" press of the push button (>500 ms) is needed to return to the sequence. Both a wired (230 V) and a radio (EnOcean) push button can be integrated for this purpose. See status diagram on the right.



COMBINATIONS OF PUSH BUTTONS AND SENSORS IN A GROUP

The controller lets you use a combination of push buttons and sensors for a luminaire, a group or for all. This considerably extends the possible uses in various applications.

To ensure the Light Controller behaves in a comprehensible and defined manner, the controller was designed to respond to combined sensor/push button inputs.

This is based on the following underlying reasoning: as soon as a person consciously intervenes in the system (by pressing a push button), all automatically controlled processes will stop. Automatic operation (sensors) will only resume after further conscious intervention (pressing the push button)

Possible Combinations:

1. Push Button with Sensor (Movement)

System status before pressing the button	Sensor active		Sensor inactive	
	Light on	Light off	Light on	Light off
Status after 1x short press	Sensor inactive	Sensor active	Sensor inactive	Sensor active
	Light off	Light on	Light off	Light on
Status after 1x long press	Sensor inactive	Sensor inactive	Sensor inactive	Sensor inactive
	Light on	Light on	Light on	Light on

2. Push Button with Sensor (Light)

System status before pressing the button	Sensor active		Sensor inactive	
	Light on	Light off	Light on	Light off
Status after 1x short press	Sensor inactive	Sensor inactive	Sensor inactive	Sensor active
	Light off	Light off	Light off	Light on
Status after 1x long press	Sensor inactive	Sensor inactive	Sensor inactive	Sensor inactive
	Light on	Light on	Light on	Light on

3. ON/OFF Push Button with Sensor

Same as for Push Button with Sensor; a long press of the button will be treated the same as a short press.

4. Timer Button with Sensor (Movement) or with Sensor (Light)

System status before pressing the button	Sensor active		Sensor inactive	
	Light on	Light off	Light on	Light off
Status after 1x press	Sensor active	Sensor active	Sensor inactive	Sensor inactive
	Light on for Time A			

5. "Sensor Activation" Push Button with Sensor (Movement) or with Sensor (Light)

System status before pressing the button	Sensor active		Sensor inactive	
	Light on	Light off	Light on	Light off
Status after 1x press	Sensor active	Sensor active	Sensor active	Sensor active
	Light on	Light off	Light on	Light off

■ USING THE INTEGRATED RELAY CONTACT TO MINIMISE STANDBY LOSSES

Every DALI ballast loses energy, even when the connected lamp is switched off. These standby losses can amount to 1 W/h.

To minimise these so-called standby losses, the LS/LSW Light Controllers both feature a relay contact that is wired to the outside at terminals a1/a2 to enable connection at the customer's premises if required. If necessary, this relay contact can be activated under the "2.2.7 Standby Relay" menu item. Please note that the contact can be configured as "Normally Open (NO)" or as "Normally Closed (NC)". A relay contact that has not been activated is always open. As soon as all the luminaires in the system have received a "light off" command, the controller will close the relay contact after a delay of approx. 40 seconds. The connected contactor then disconnects system luminaires from mains power.

Contact status of the integrated standby relay:

	Normally Open, NO	Normally Closed, NC
Normal operation, at least 1 luminaire still on		
40 sec. after the last luminaire has been switched off		
Relay not activated		

As soon as the controller receives a signal from the sensors or push buttons, which remain active throughout, the relay contact is opened again and system luminaires are reconnected to mains power. Subsequently, the controller transmits the signal to the respective luminaires.

Some older generations of DALI control gear, in particular, need several 100 ms to restart and to correctly process DALI commands after being switched on. For this reason and because of the contactor's switching delay, the DALI command to switch on is only triggered after a delay of approx. 1 second once the relay has been switched on.

■ USING THE INTEGRATED RELAY CONTACT TO SWITCH OFF/CONTROL BUILDING FACILITIES (HVAC...)

As described above, a connected contactor can also be used to automatically control other building facilities. Instead of disconnecting luminaires from the mains, a contactor can equally be used to disconnect other systems from the mains. See description above.

■ SETTING THE TIME AND DATE (MENU ITEM: CLOCK)

The correct time and date must be entered to use the sequencer function.



If an invalid time is detected when the system is powered up, "Clock Error" will appear and the date/time will have to be entered after pressing the rotary push key.

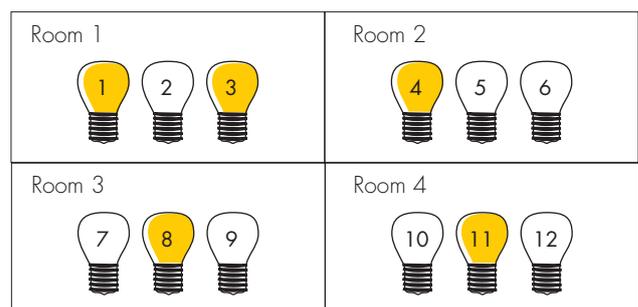
- The date and time are set using the rotary push key, during which process the respective weekday is also shown.
- As a safeguard in the event of a power failure, the time will be buffered for at least 1 hour.
- Given the most unfavourable operating conditions (temperature/humidity), the entered time will deviate by a maximum of 12 minutes over the course of a year. Given use under normal operating conditions, it is sufficient to adjust the time manually once a year.

■ SETTING THE BURGLAR STOP FUNCTION (MENU ITEM: BURGLAR STOP)

The burglar stop function increases the security of unguarded buildings by simulating human presence. To this end, the respective luminaires will first have to be selected, after which the light level and the period of time the selected luminaires are to remain switched on will have to be defined. Within this period of time, the LS/LSW Light Controllers will pick a luminaire at random (from those previously selected) and switch it on at a previously defined luminance and for an automatically defined period of time.



Just like the sequencer function, this function therefore also relies on the correct time having been entered.



Selected luminaire(s)

Each of the selected luminaires will stay switched on for a random period of time.

■ DEFINING SYSTEM RESPONSE ON RESTORATION OF MAINS POWER AFTER A POWER FAILURE (MENU ITEM: SYSTEM RESPONSE)

In the event of a power failure, the way a luminaire, a group or all luminaires will behave when mains power is restored can be exactly defined in the controller.

You can choose among the following three options:

1. Light off (default setting)
2. Light on (Active LL)
3. Light on (Active LL) for Time A

Compare example on page 13

■ CREATING PASSWORD PROTECTION (MENU ITEM: PASSWORD)

To protect the system from unauthorised access, a 4-digit password can be set that will then need to be entered prior to carrying out any configuration steps.

Access to the error analysis function remains unaffected by password protection.

If the password is lost, please contact your VS representative and specify the respective push button of the Light Controller. To this end, please use the rotary push key to select the following menu items on the screen:

Settings ➤ Info

Turn the rotary push key to the right 5x, then to the left 3x, then press the button. The details of the push button you will need to quote will now appear on the controller's display screen.

Default setting: 0000

➤ No password

■ USING THE ERROR ANALYSIS FUNCTION (MENU ITEM: SYSTEM CHECK)

The system check function can help to minimise maintenance work on the lighting system. The check analyses three possible error sources:

1. The Light Controller fails to recognise one or several luminaires.
2. The Light Controller fails to recognise one or several sensors.
3. The luminaire is recognised, but reports a lamp error.

Possible causes for errors 1 and 2:

- DALI control line to the affected luminaire or sensor is missing or interrupted.
- Mains power to the affected luminaire is missing or interrupted.
- The ballast of the affected luminaire or the sensor is defective or missing.

Possible causes for error 3:

- The lamp of the affected luminaire is missing.
- The lamp of the affected luminaire is defective.

Failure analysis can only be carried out after luminaires and sensors have been assigned an address (see "Luminaire/Sensor Search" starting on page 21).

LIGHT CONTROLLER LS / LSW

MANUAL VERSION 1.0

SOFTWARE VERSION 1.3

AND HIGHER

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GENERAL INFORMATION

■ EXPLANATION OF CONFIGURATION TOOLS

Rotary Push Key

The rotary push key (or rotary encoder) is the operating element of the LS and LSW Light Controllers. The rotary push key is located to the right of the display screen.

The rotary push key is used to navigate through the selection lists and dialogue windows of the menus (see "Menu Structure" on page 18).

Selections are made by turning the key; subsequently pressing it will then confirm, select, activate or call up the selected item. The current menu item or selection can be identified on the display screen by the black background of the text.

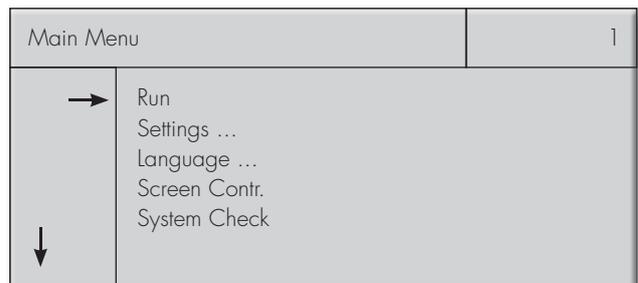
Screen

The resolution of the black-and-white LCD screen is 128 x 64 pixels. Additional LED backlighting makes the screen convenient to work with, even if there is little light in the distribution board.

The first press of the rotary push key switches the backlighting of the display screen on, the second press of the key then switches the controller to configuration mode and the individual menu items can be called up. If the key is not activated within approx. 90 seconds, the LED lighting will switch off. Pressing the key again will switch the light back on and you can continue with the configuration where you left off.

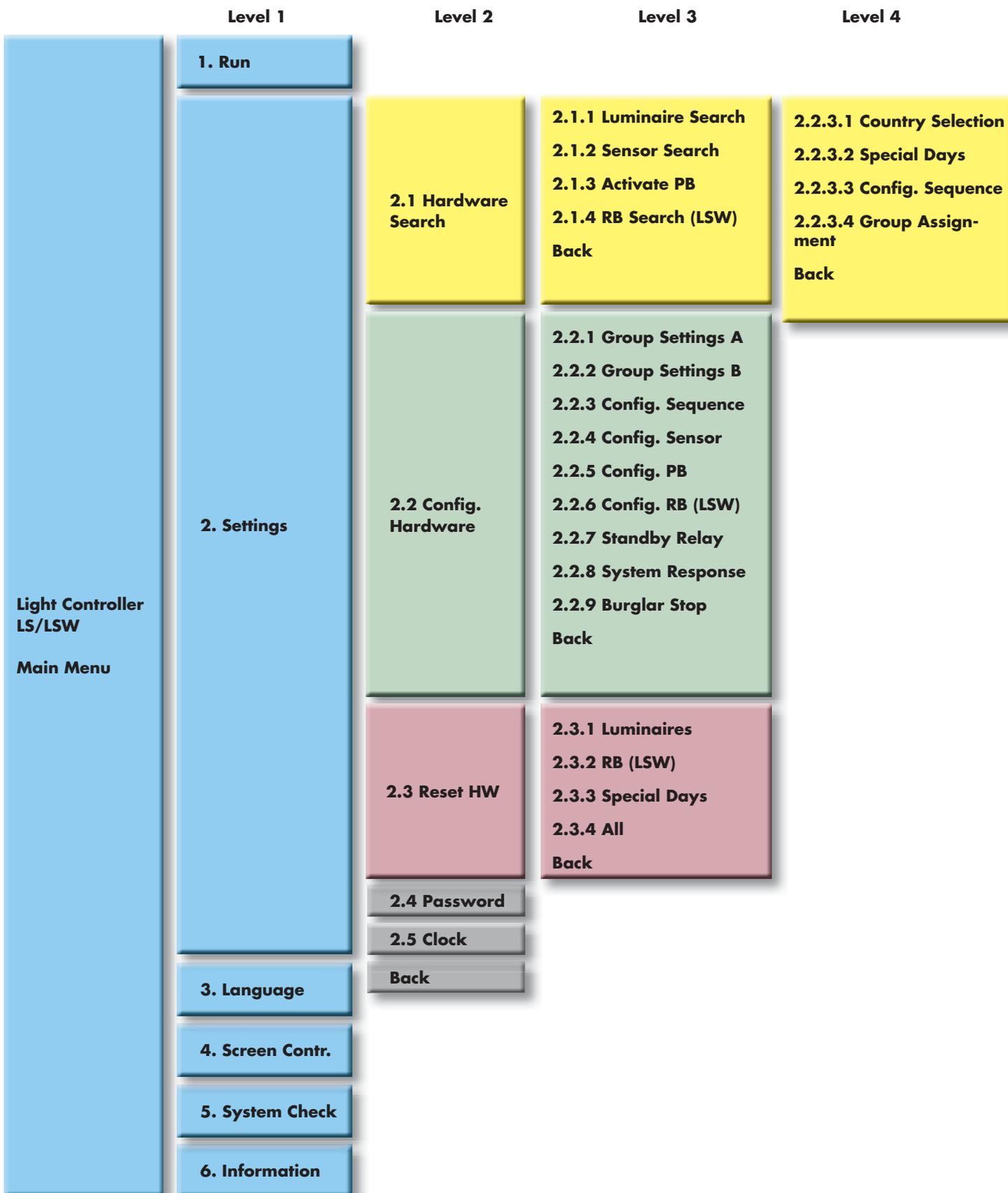
If the rotary push key is not pressed for at least 10 minutes, the controller will automatically switch to normal mode and begin to carry out the configuration settings made up to that point. To continue the configuration process, the respective menu item will have to be called up again.

The "Screen Contr." item in the main menu can be used to adjust the screen contrast.



■ MENU STRUCTURE OF THE LS/LSW LIGHT CONTROLLERS

General Menu Structure



System Configuration

Screen Layout

The menu consists of four segments:

- 1 Menu Level
- 2 Menu Number
- 3 Navigation Aid
- 4 Selection List

Segments 1 and 2 as well as the level name and its number form the heading (marked in yellow here), which is clearly set apart from the other segments.

The arrows in segment 3 indicate how many options there are.

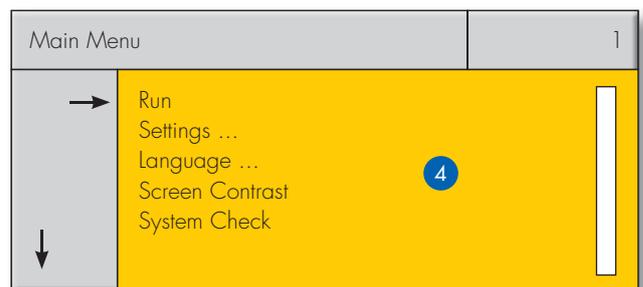
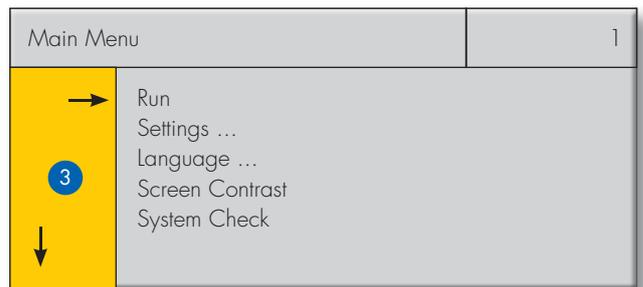
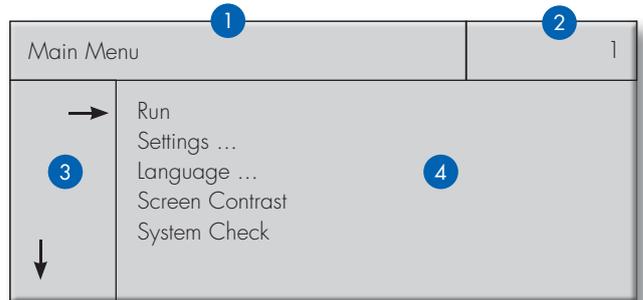
Vertical arrows indicate that further menu items will become visible by turning the rotary push key.

Horizontal arrows point to the selected menu item, which can be activated by pressing the rotary push key.

Segment 4 can be chosen as required by pressing the rotary push key. Three dots (...) after a menu item indicate that there are further levels/menu items under this item.

The scroll bar on the right in the dialogue window indicates that further menu items will become visible if the key is rotated above or below the shown menu items.

The menu structure consists of a maximum of 4 levels (see page 18). Selecting a menu item will take you down a level, while selecting "Return" will take you up a level.



Testing the System

The lighting system should be installed in accordance with the installation instructions and tested prior to system configuration.

Errors or problems can occur during configuration if the installation was not properly carried out.

System Configuration

Once the search has ended, the number of DALI luminaires the system has found will be displayed on the screen.

System response:

All luminaires connected to the system will be switched on at the lowest dimmer setting.

Confirming "OK" will take you back to the menu and if necessary, a new search can be started with "Search again".

Result:

Once the search for luminaires has come to an end, all luminaires will have been integrated and will have been assigned a unique address.

Find Sensor (2.1.2)

Action/Aim:

Integrating installed sensors into the system.

To this end, please use the rotary push key to select the following menu items on the screen:

Settings → Hardware Search → Sensor Search

Two consecutive searches will be carried out, both of which will start automatically.

Part 1 searches for **already existing** DALI sensors. As the system will just have been reset and this equates to a new installation, no DALI sensors will be found.

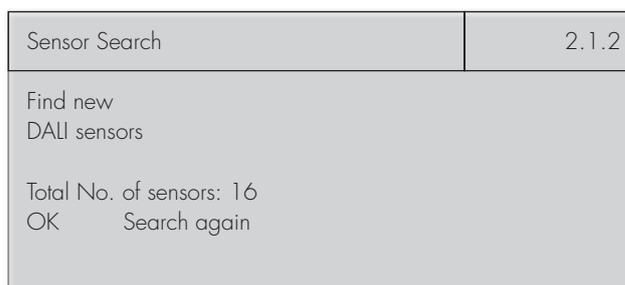
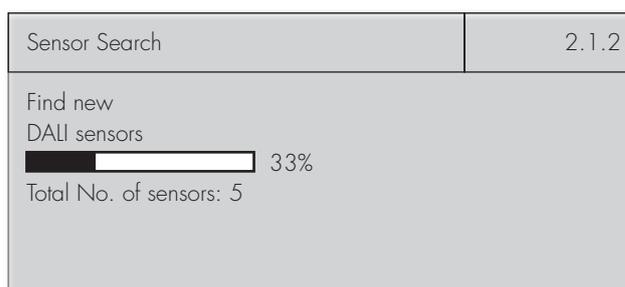
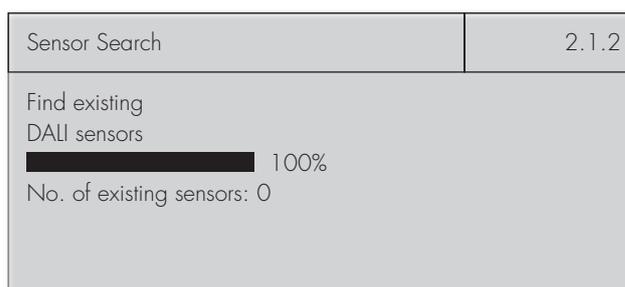
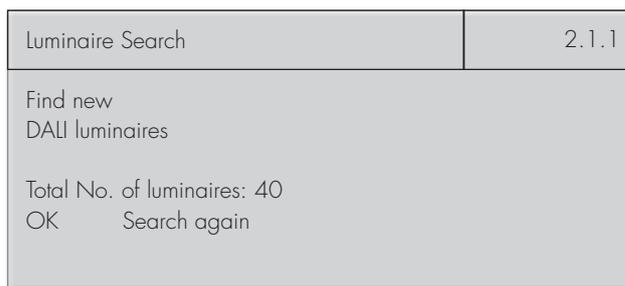
Part 2 then automatically searches for new DALI sensors. The screen shows a running total of the number of new DALI sensors that are found.

Once the search has come to an end, the number of DALI sensors recognised by the system will be displayed on the screen.

Confirming "OK" will take you back to the menu and, if necessary, a new search can be started with "Search again".

Result:

Once the search for sensors has come to an end, all sensors will have been integrated and will have been assigned a unique address.



Activate PB (2.1.3)

Action/Aim:

Activating the required push button inputs for the system.

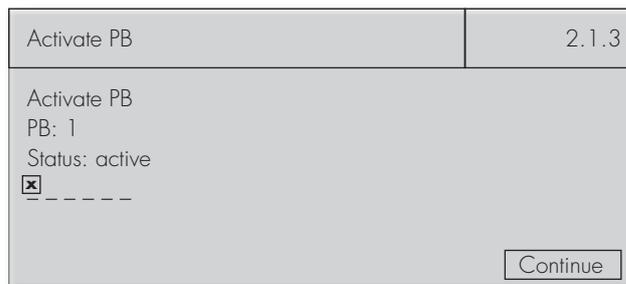
To this end, please use the rotary push key to select the following menu items on the screen:

Settings → Hardware search → Activate PB



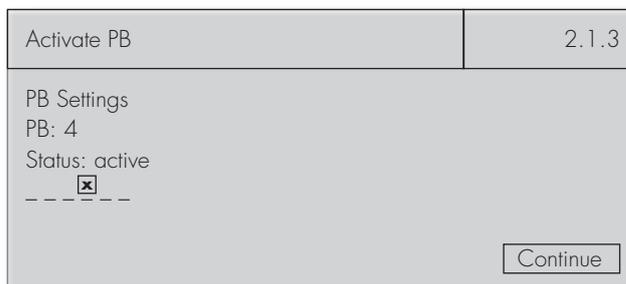
Push button inputs must first be activated before they can be configured. Only activated push button inputs can be configured.

Each of the push button inputs is represented on the screen by an underscore (_). The input is activated by selecting the respective PB input and then pressing the rotary push key to confirm. Pressing the rotary push key again will deactivate the input. PB input 1 is active by default, but can be deactivated again if necessary.



The on-screen message "PB input: 1 active" corresponds to the default setting.

In the example on the right, input 4 is now active (marked with an x).



Result:

The system will have recognised all installed push buttons.



Only for the LSW Light Controller: RB Search (2.1.4)

Action/Aim:

Integrating the required wireless modules into the system.

To this end, please use the rotary push key to select the following menu items on the screen:

Settings → Hardware Search → RB Search

System response:

The wireless module must be activated to establish a wireless connection to the controller.



IMPORTANT

Briefly pressing any module button will tell you the Light Controller's module address.

The wireless address will be displayed on the screen after pressing the radio button.

Repeated presses of the radio button will ensure that the right module is integrated. The number of radio button presses is displayed on the screen. To integrate the module, please confirm "Yes" on the screen.

The total number of integrated wireless modules will be displayed on the screen. Repeat the procedure to integrate further wireless modules.

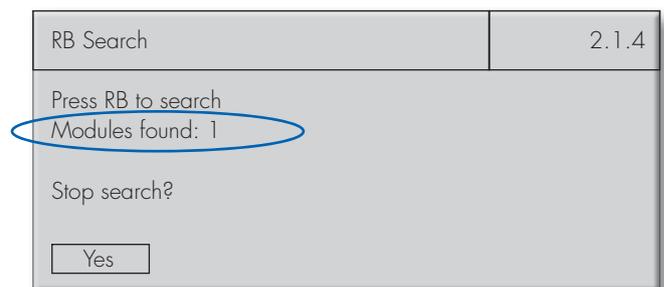
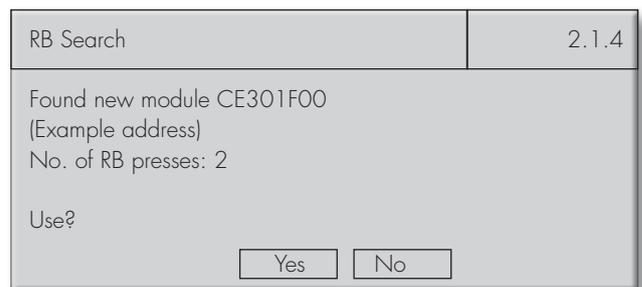
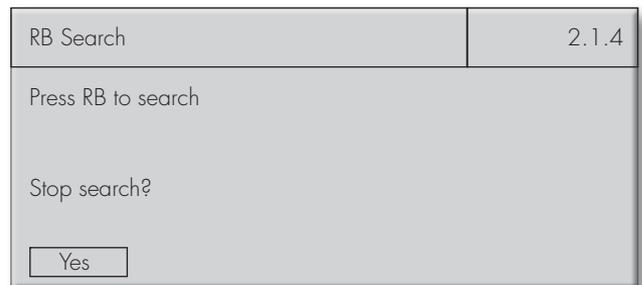
Result:

The system will have recognised all installed wireless modules



IMPORTANT

Any buttons pressed on already integrated wireless modules will be ignored to prevent duplicate integration.



HARDWARE CONFIGURATION

Group Settings (2.2.1 & 2.2.2)

Action/Aim:
Creating luminaire groups.

1. Method for Group Settings A

To this end, please use the rotary push key to select the following menu items on the screen:

Settings → Config. Hardware → Group Settings A

The following data-importing process can take several seconds.

Each of the luminaires integrated in step 2.1.1 will be represented by an underscore (_). Individual luminaires can now be selected and assigned to the group you are creating using the rotary push key. Your current selection will be marked with a square (□). The address of the selected luminaire will also be displayed.

System response:

For easy identification during installation, the selected luminaire will be switched on at a light level of 100%.



It is recommended to enter the luminaire address in the lighting plan to enable clear allocation of the address to the installation location at a later date.

Pressing the key will then assign the selected luminaire to the above-mentioned group., marked on the screen with an x. Pressing the key again will reverse this assignment..

- x = Group device
- _ = Non-group device

System response:

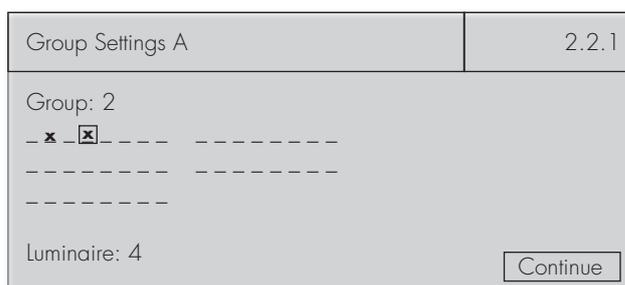
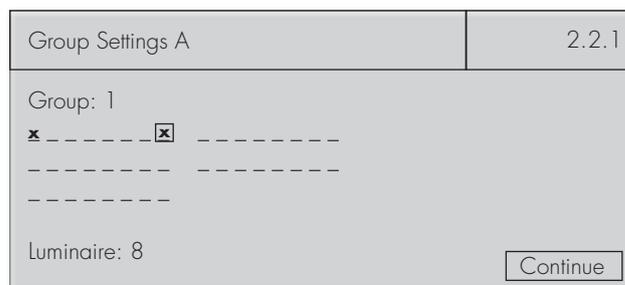
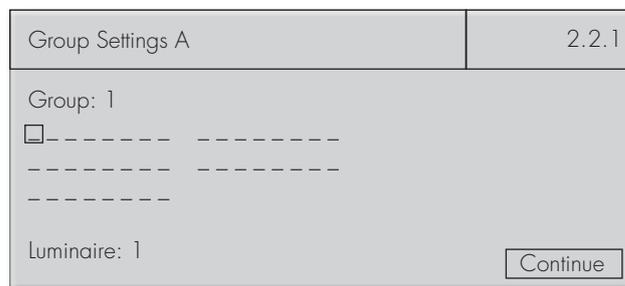
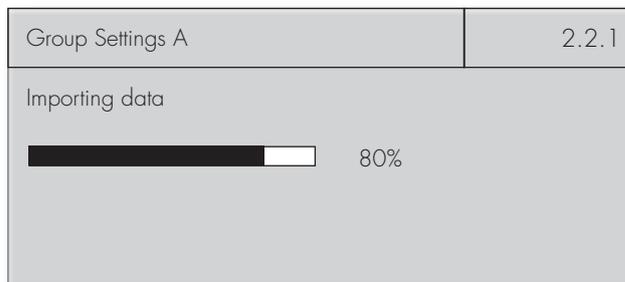
As soon as a luminaire has been assigned to a group it will, even if it is no longer selected, remain switched on at a light level of

Luminaire Status in the System	Meaning
100 % Licht	Luminaire marked with the cursor on the screen
min. Dimmlevel	Part of the current group
OFF	Does not belong to the current group

To define further groups, select the next group and repeat the process.



A luminaire can also be assigned to more than one group, e.g. assignment of luminaire 1 to group 1 and group 2.



2. Method for Group Settings B

To this end, please use the rotary push key to select the following menu items on the screen:

Settings → Config. Hardware → Group Settings B

Each of the luminaires integrated in step 2.1.1 can now be assigned to the various groups. To this end, use the rotary push key to select the respective group(s) and press to confirm.

Group Settings B	2.2.2
Luminaire: 1 Group: 6 ----- x ----- <div style="text-align: right;">Continue</div>	

Sequence Configuration (2.2.3)

Action/Aim:

The term sequences refers to timed sequences of different light levels that can be called up on fixed weekdays, public holidays or other special days.

To this end, please use the rotary push key to select the following menu items on the screen:

Settings → Config. Hardware → Config. Sequence

Country Selection (2.2.3.1)

You can choose from a list of countries for which information on public holidays has been stored (see table in the Appendix) and will become useful later.

Country Selection	2.2.3.1
Select the country for which you wish to use the relevant public holidays: Germany <div style="text-align: right;">Continue</div>	

Special Days (2.2.3.2)

Should different sequences be required for additional days (special days) other than fixed public holidays, the dates of these days can be entered manually, for which three categories are available: annually, monthly and once.

Special Days	2.2.3.2
1. Annually 01.01. 2. Monthly 01 3. Once 01.01.13 4. ... <div style="text-align: right;">Continue</div>	

Sequence Definition (2.2.3.3)

Up to 16 different sequences (24-hour sequences) can be defined for groups (2.3.3.4). To this end, time periods (times) are sequenced, which together cover the whole day (24 hours). A respective light level is specified for each of these time periods (DALI value 0 = OFF, 126 = 3% and 254 = 100%) as well as a fading time (F) (see page 14, Sequence Configuration).

Sequence Definition	2.2.3.3
Sequences 1 1: 00:00 – 02:30 F: 15 [Progress bar] 254 2: 02:30 – 24:00 F: 0 [Progress bar] 0 <div style="text-align: right;">Continue</div>	

Group Assignment (2.2.3.4)

As a final step, an individual profile (consisting of different sequences for different days) can be defined for each group (max. 16). After switching "Sequences inactive" to "active", selecting "... will let you assign a pre-set sequence (2.2.3.3) to each day (Sat, Sun, Mon, Tues, Wed, Thurs, Fri, Public Holiday, Special Day, daily, weekdays, and weekends). The resulting assignments of days and sequences will be displayed underneath the separating line and can be processed if necessary.

Group Assignment		2.2.3.4
Group:	1	<div style="text-align: right;">Continue</div>
...		
Sat	2	
Sun	2	
Mon	1	

Config. Sensor (2.2.4)

Action/Aim:

Assigning functions and luminaires to VS MultiSensors.

To this end, please use the rotary push key to select the following menu items on the screen:

Settings ➔ Config. Hardware ➔ Config. Sensor

The information on the right will appear after these steps have been carried out if no sensors have been integrated into the system (see "Sensor Search" on page 21).

Config. Sensor		2.2.4
Sensor configuration not possible		
No sensor found		
Continue		

➔ 1st Case Movement Detection Only

- Select the sensor you want to configure by turning and pressing the rotary push key.

System response:

The red LED of the selected sensor will begin to flash.

- Select what you want to control among All, Group X or Luminaire X under the "Controls" menu item.

System response:

The selected luminaires are addressed and will light up.

- After selecting the "Movement" menu item, you can set the mode of the movement sensor:
 - On-Off = automatic
 - Off = semi-automatic
- Now set Time A in the same way.
 - Options: 10 s, 15 s, 30 s, 45 s, 1 min, 2 min, 5 min, 8 min, 10 min, 15 min, 20 min, 30 min, 60 min, 90 min
 - Default setting: 30 s
- Confirming "Continue" will close the dialogue field and save all settings.

Config. Sensor		2.2.4
Sensor: 1 Controls: Group 1 Movement: On-Off Time A: 5 min Luminance: inactive		
Continue		

➔ 2nd Case Luminance Control Only



IMPORTANT

If the sensor is to be used solely for luminance control, at least one additional button will have to be configured for the same luminaires to activate the system and switch it off (see "Config. PB/ Config. PB" starting on page 29.). If control is to be effected without a push button, the system's switching-on behaviour after a power failure must be set to "Light on" in the "System Response" menu item.

Select the sensor you want to configure by turning and pressing the rotary push key. System response: The sensor's red led will begin to flash.

- Select what you want to control among All, Group X or Luminaire X under the "Controls" menu item. System response: The selected luminaires are addressed and will light up.
- After selecting the "Luminance" menu item, the light sensor can be activated. Once activated, further menu items for lighting control will appear on the screen.
- Under the DALI menu item, the constant light level can be set using the rotary push key.

Default setting: 100% light level.

For orientation purposes, the DALI bar on the screen will tell you which light level setting is currently active. The precise dimming value is shown next to the bar as a DALI value between 126 (3% light) and 254 (100% light)

If there is a need to set the system to a certain lux value, readings will have to be taken on site using a suitable gauge (i.e. lux meter) and the DALI value (target value) then adjusted until the desired luminance has been reached.

Check your settings using the second bar on the screen. This will tell you the current measured value (actual value) of the selected light sensor in %. The actual value will also change in response to any changes to the DALI value (target). Changing the actual % value on the screen is not carried out analogously to changing the DALI target value.



IMPORTANT

A lighting control test can be carried out by using the rotary push key to dim the DALI value (target) up or down. If no change of the actual value is seen over the entire process during this step, the position of the sensor and the gauging method should be rechecked:

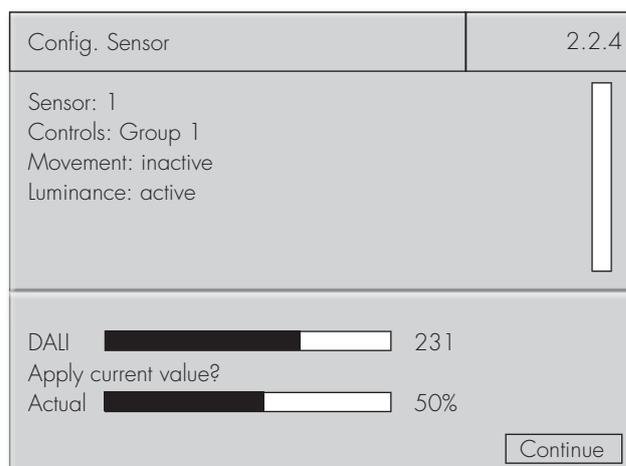
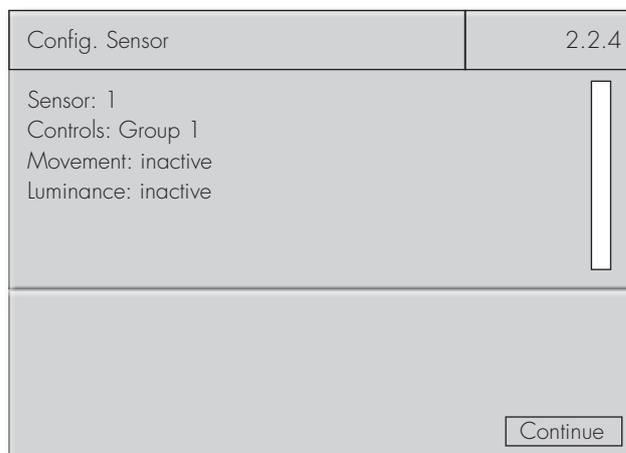
- Shielding due to walls, objects
- Distance from the group you want to control
- External light source

By subsequently confirming the "Apply current value?" menu item, the light value will be used for control purposes.



INFO

Only one light sensor can be active per group/ luminaire to avoid contradictory information. Selecting "Continue" will close the dialogue window and save all settings.



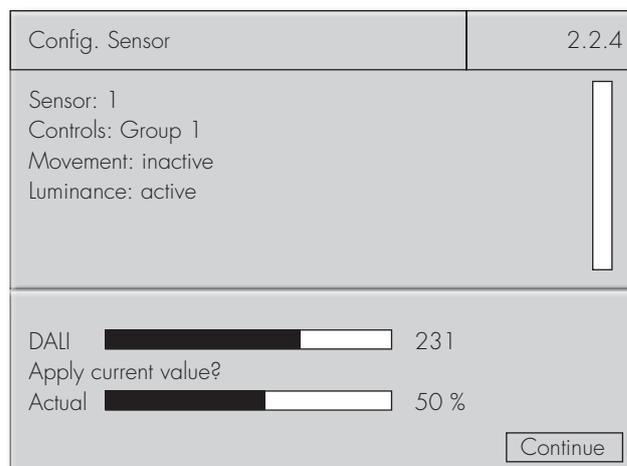
You can check your settings in the second bar on the screen. The bar displays the current measured value (actual) of the selected light sensor in %. The actual value will also change in response to any changes to the DALI value (target). Changing the actual % value on the screen is not carried out analogously to changing the DALI target value.



A lighting control test can be carried out by using the rotary push key to dim the DALI value (target) up or down. If no change of the actual value is seen over the entire process during this step, the position of the sensor and the gauging method should be rechecked:

- Shielding due to walls or objects
- Distance from the group you want to control
- External light source

By subsequently confirming the menu item "Apply current value?" menu item, the light value will be used for control purposes.



Only one light sensor can be active per group/luminaire to avoid contradictory information. Selecting "Continue" will close the dialogue window and save all settings.

➤ 3rd Case

Movement Detection and Luminance Control

- Sensor configuration as described starting on page 25.
- Please note the following:
Light control active only during the "Active Light Level" count-down of the movement sensor.
When switched on as a result of movement detection or the press of a push button, the luminaires will light up at the same luminance they had when switched off.

Config. PB and Config. RB (2.2.5 & 2.2.6)

Action/Aim:

Assigning functions and luminaires to push buttons.

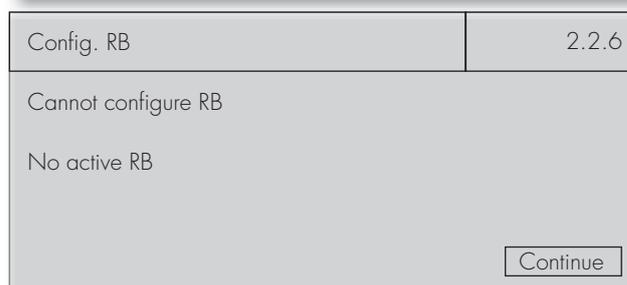
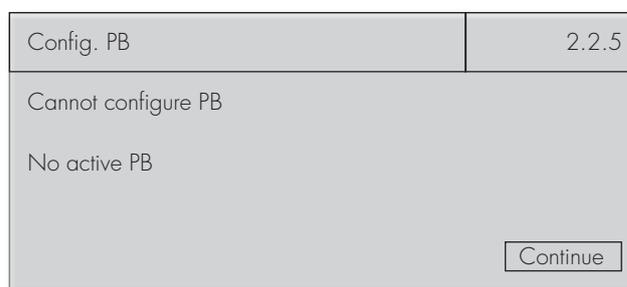
To this end, please use the rotary push key to select the following menu items on the screen:

Settings ➤ Config. Hardware ➤ Config. push buttons/radio buttons

The information shown on the right will only appear after performing the various steps if no push buttons/radio buttons have been integrated into the system (see "PB Search/RB Search" on page 23).

Standard push buttons just as radio buttons are configured in the same way; only the addresses differ:

- Standard push button: 1 (von 1–6)
- Radio buttons: Radio button 1/1 (von 1/1–1/4 bis 16/1–16/4)



➤ 1st Case Push button

- Select the push button by turning and pressing the rotary push key or, if selecting a radio button, by pressing the respective button on the wireless module.
- Select what you want to control among All, Group X or Luminaire X under the "Controls" menu item, for instance Group 1, by turning and pressing the rotary push key.
- System response:
- The selected luminaires will then be controlled by the selected push or radio button.

Config. PB	2.2.5
PB: 1 Controls: Group 1 Works as: Push	
<input type="button" value="Continue"/>	

➤ 2nd Case As a timer

- Select the desired timer by "turning and pressing" the rotary push key or (if using a radio button) by pressing the respective key on the module.
- Select what you want to control among All, Group X or Luminaire X under the "Controls" menu item, for instance Luminaire 1, by turning and pressing the rotary push key. The respective device will then be controlled by the selected button.
- Select "Timer" under "Works as" by turning and pressing the rotary push key. The selected push or radio button will then be in timer mode.
- Set "Time A" to the minimum time; options: 10 s, 15 s, 30 s, 45 s, 1 min, 2 min, 5 min, 8 min, 10 min, 15 min, 20 min, 30 min, 60 min, 90 min; Default setting = 30 s
- Selecting "Continue" will close the dialogue window and save all settings.

Config. PB	2.2.5
PB: 1 Controls: Luminaire 1 Works as: Timer Time A: 10 sec	
<input type="button" value="Continue"/>	

➤ 3rd Case As an ON/OFF button

- Select the activated and desired button by "pressing and turning" the rotary push key or (given a radio button) by pressing the respective button on the module.
- Select what you want to control among All, Group X or Luminaire X under the "Controls" menu item, for instance Luminaire 1, by turning and pressing the rotary push key. The respective device will then be controlled by the selected button.
- Select "ON/OFF" under "Works as:" by "turning and pressing" the rotary push key. The selected button will now be in ON/OFF mode.
- Selecting "Continue" will close the dialogue window and save all settings.

Config. PB	2.2.5
PB Input: 1 Controls: Luminaire 1 Works as: ON/OFF	
<input type="button" value="Continue"/>	

➤ 4th Case

As a "Sensor-Activation" Button

- Select the desired push button by "turning and pressing" the rotary push key or (given a radio button) by pressing the respective button on the wireless module.
- Select what you want to control among All, Group X or Luminaire X under the "Controls" menu item, for instance Luminaire 1, by turning and pressing the rotary push key. The selected device will then be controlled by the selected button.
- Select "Sensor" under "Works as:" by "turning and pressing" the rotary push key. The selected button will then be in sensor mode.
- Selecting "Continue" will close the dialogue window and save all settings.

Config. PB	2.2.5
PB Input: 1 Controls: Luminaire 1 Works as: ON/OFF	
<input type="button" value="Continue"/>	

Config. PB	2.2.5
PB: 1 Controls: Luminaire 1 Works as: Sensor	
<input type="button" value="Continue"/>	

➤ 5th Case

As a Central Button

- Select the desired button by "turning and pressing" the rotary push key or (given a radio button) by pressing the respective button on the module.
- Select "Central" under "Works as:" by "turning and pressing" the rotary push key. The selected button will then dim all devices to 0%.

Config. PB	2.2.5
PB: 1 Works as: Central Button	
<input type="button" value="Continue"/>	

Standby Relay (2.2.7)

Action/Aim:

Activating the standby relay.

To this end, please use the rotary push key to select the following menu items on the screen:

Settings ➤ Config. Hardware ➤ Standby Relay

Select the "Use" field by turning and pressing the rotary push key, then confirm with "Yes".

Two further menu items will now appear:

"Contact":

Turn the rotary push key to select the "NC" (normally closed) or "NO" (normally open) contact type

"Delay":

It is recommended to set "Delay" to "Yes" as some electronic ballast manufacturers define longer starting up times after reconnection to mains power.

Standby Relay	2.2.7
Standby Relay	
Use: Yes Contact: NO Delay: Yes	
<input type="button" value="Continue"/>	

System Response: Light Level (2.2.8)

Action/Aim:
Defining the light level.

To this end, please use the rotary push key to select the following menu items on the screen:

Settings → Config. Hardware → System Response



IMPORTANT

Please observe the information regarding light level configuration on pages 12 and 13.

→ Defining Light Levels for Luminaires, Groups or All

- Select the unit (All, Group X, Luminaire X) you want to configure by turning and pressing the rotary push key under "For:", e.g. Group 1.
- The respective device will now be addressed.
- "Active LL:", "Passive LL:" or "Basic LL:" can now be selected by "turning and pressing" the rotary push key.
- Every light level is shown in % and as a DALI value (0–254).
- Set "Time B" to the desired time period.
- Selecting "Continue" will close the dialogue window and save all settings.

System Response	2.2.8
Set light level for: Group: 1 Active LL: 246 80%	<input type="text" value="80"/>
Passive LL: 0 0%	
Time B: 0 sec. Basic LL: 0 0%	<input type="text" value="0"/>
<input type="button" value="Continue"/>	

System Response	2.2.8
Set light level for: Luminaire 1 Active LL: 254 100%	<input type="text" value="100"/>
Passive LL: 131 10%	
Time B: 10 sec. Basic LL: 0 0%	<input type="text" value="0"/>
<input type="button" value="Continue"/>	

System Response	2.2.8
Set light level for: All Active LL: 246 80%	<input type="text" value="80"/>
Passive LL: 210 30%	
Time B: 10 sec. Basic LL: 145 5%	<input type="text" value="5"/>
<input type="button" value="Continue"/>	

System Response on Restoration of Mains Power (2.2.8)

Action/Aim:

Defining switching-on behaviour on restoration of mains power after a power failure.

To this end, please use the rotary push key to select the following menu items on the screen:

Settings ➤ Config. Hardware ➤ System Response

➤ Defining Start Behaviour for Luminaires, Groups or for All.

- Select the unit (All, Group X, Luminaire X) you want to configure by "turning and pressing" the rotary push key under "For:", e.g. "Group 1".
- The respective unit will now be addressed.
- Now turn the button to its lowest point, after which you can define the system's switching-on behaviour after a power failure has ended under the "Light" menu item:
 - Light On
 - Light Off
 - Light On for Time A



INFO

If Time A was not defined during sensor or PB configuration for the unit in question, the default setting of 30 s will apply.

- Selecting "Continue" will close the dialogue window and save all settings.

System Response	2.2.8
Set light level for: Group: 1	
Active LL: 246	80%
Passive LL: 0	0%
Time B: 0 sec.	
Basic LL: 0	0%
After power failure Light:	OnTime A <input type="button" value="Continue"/>

Burglar Stop (2.2.9)

Action/Aim:

Defining light levels for certain time periods to simulate intervention in the system (human presence).

To this end, please use the rotary push key to select the following menu items on the screen:

Settings ➤ Config. Hardware ➤ Burglar Stop

- The desired time period can then be defined using the 24-hour clock system (pre-set to: 00:00 – 00:15).
- Then define the light level in DALI format (0 = off, 126 = 3% and 254 = 100%).
- An overview of available luminaires will then be displayed. You can define from which luminaires the Light Controller is to make a random choice within the defined time period. The luminaire marked in each case is shown at the bottom end of the screen with "Luminaire: ...".

Burglar Stop	2.2.9
00:00 – 00:15	254
x _x_ _	
Dim Level 100%	<input type="button" value="Continue"/>



INFO

Only already integrated luminaires can be selected.

Selecting "Continue" will close the dialogue window and save all settings.

Creating a Password (2.4)

Action/Aim:

Activating a password to protect the controller from unauthorised access.

To this end, please use the rotary push key to select the following menu items on the screen:

Settings → Password

Default setting: 0000 (no password)

In the example on the right, a password has been created that will need to be entered every time the settings are changed.



NOTE

After entering the password, return to "Run" mode to validate the password.

Should you forget the password, please contact your VS representative.

Password	2.4
Password 1 2 3 4	
<input type="button" value="Continue"/>	

MODIFYING AN EXISTING INSTALLATION

■ DUPLICATE ADDRESSES

Modifying an existing installation means having to make alterations to a system in which connected devices will normally already have been assigned an address. If further components are added to the system, there is a risk of luminaires and sensors being assigned a duplicate address.

Duplicate Addresses: Luminaires

Should a duplicate address be found, the controller will delete one of the luminaire addresses and will assign the next free address to the device instead.

Running this menu item will remove any duplicate addresses.

Afterwards, please check your group settings to ensure luminaires are assigned to their correct groups.

If group assignment is not required, please assign the luminaire to the respective sensor, PB or RB with which you want to control the luminaire (see "Config. Sensor" on pages 25–27 or "Config. PB/Config. RB" on pages 27–29).

Duplicate Addresses: Sensors

Should a duplicate address be found, the controller will delete one of the two sensor addresses and assign the next free address to the device instead.

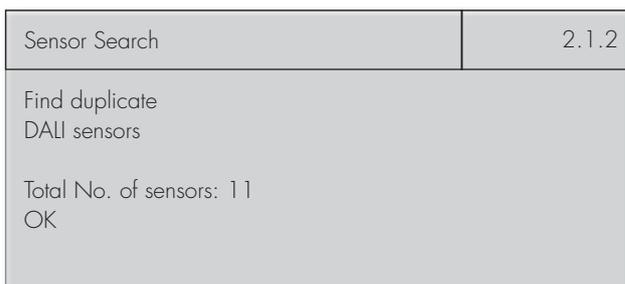
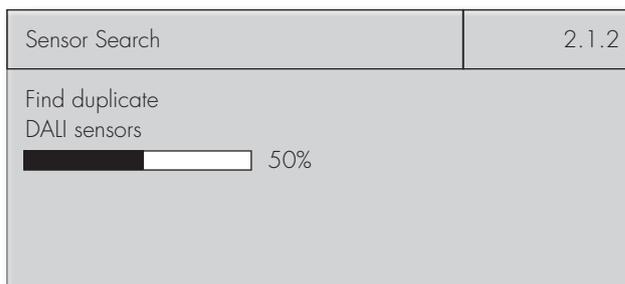
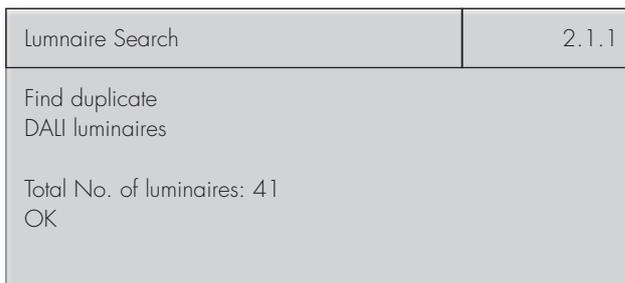
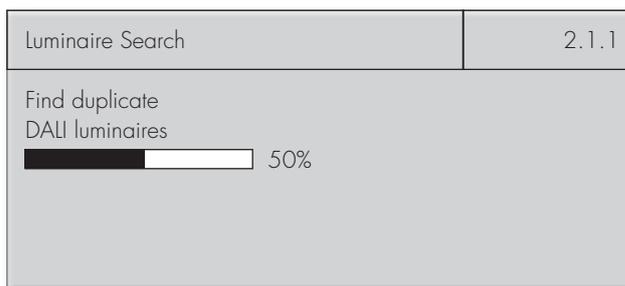
Running this menu item will remove any duplicate sensor addresses.

Afterwards, please check your sensor settings and adjust as necessary.

In the following, any situations that make it necessary to run a check for duplicate addresses will be marked as follows:



For this reason, **an automatic search** for duplicate addresses will be carried out once you have finished the modification process.



REPLACING COMPONENTS

Luminaire/Ballast Defect

1. First disconnect the respective luminaire/ballast from the mains and the DALI supply line, and remove the defective component.

2. Then use the rotary push key to select the following menu items on the screen:

Settings → Hardware Search → Luminaire Search
This will now delete the defective luminaire or ballast in the system software and make the address available again.



3. Now install the new luminaire or ballast in accordance with the respective instructions and then reconnect the device to the mains power.

4. Re-running the "Luminaire Search" menu item will assign the old (removed) luminaire's address to the new luminaire.



5. Then add the luminaire address to the respective group under the "Group Settings" menu item.

Replacing a Sensor

Repeat steps 1–4 as for "Luminaire Defect".

Settings → Hardware Search → Sensor Search

The new sensor will then have been configured in the same manner as the one replaced.



EXTENDING AN EXISTING INSTALLATION

Any new components must be installed before the system configuration can be modified.

Add Luminaires

Action/Aim:

Integrating luminaires into an existing system.

→ Search for new luminaires (2.1.1)

To this end, please use the rotary push key to select the following menu items on the screen:

Settings → Hardware Search → Luminaire Search

The number of existing luminaire addresses will be displayed on the screen.



An automatic search for new luminaires without an address will then begin and addresses assigned to any new luminaires.

The new number of DALI addresses will then be displayed on the screen. Confirming "OK" will activate the next menu item (Search for Duplicate Addresses), while confirming "Search again" will repeat the luminaire search.

Luminaire Search	2.1.1
Find new DALI luminaires ██████████ 100% Total No. of luminaires: 40	

Luminaire Search	2.1.1
Find new DALI luminaires ██████████ 100% Total No. of luminaires 41	

Luminaire Search	2.1.1
Find new DALI luminaire Total No. of luminaires: 41 OK Search again	

Add Sensors

Action/Aim:

Integrating sensors into an existing system.

➤ Search for New Sensors (2.1.2)

To this end, please use the rotary push key to select the following menu items on the screen:

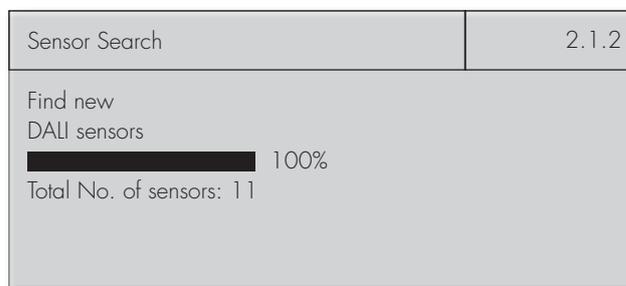
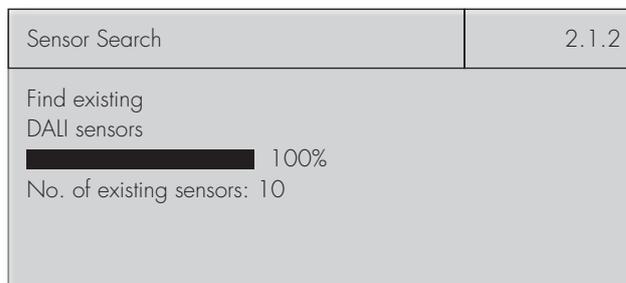
Settings ➤ Hardware Search ➤ Sensor Search

The number of existing sensor addresses will be displayed on the screen.

DA

An automatic search for new sensors without an address will then begin and an address will be assigned to any new sensors.

The new number of sensor addresses will then be displayed on the screen. Confirming "OK" will activate the next menu item (Search for Duplicate Addresses), while confirming "Search again" will repeat the sensor search.



Add PB (2.1.3)

Action/Aim:

Integrating a PB (push button) into an existing system.

➤ Activate PB

To this end, please use the rotary push key to select the following menu items on the screen:

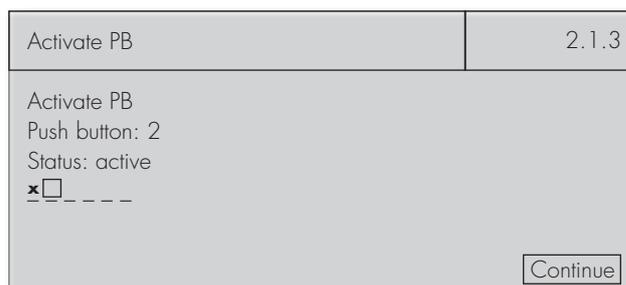
Settings ➤ Hardware Search ➤ Activate PB

- Activate the connected PB input.
- In the example on the right: PB input 1 is already active. – PB 2 will now be activated with a press of the rotary push key (cursor position). The activated PB is now ready for configuration (see "Config. PB/Config. RB" on pages 27–29).



INFO

Please ensure that the cable is connected to the correct PB input.



Add RB

Action/Aim:

Integrating an RB (radio button) into an existing system.

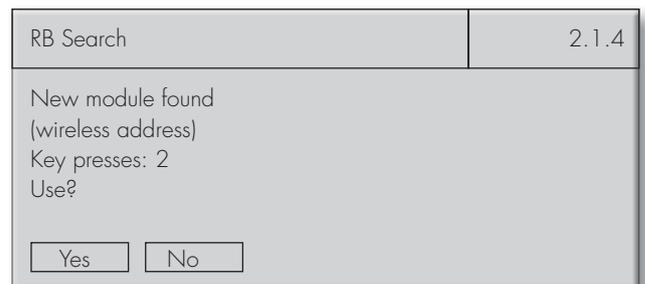
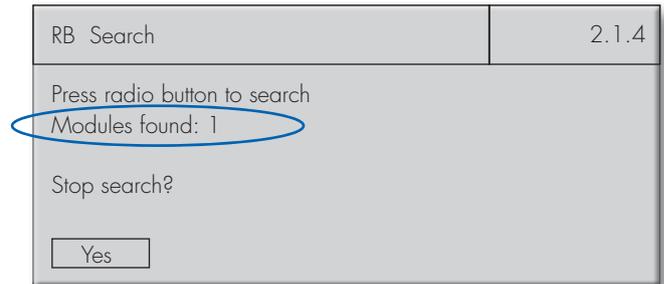
➤ RB Search (2.1.4)

To this end, please use the rotary push key to select the following menu items on the screen:

Settings ➤ Hardware Search ➤ RB Search

1. The number of integrated modules will be displayed under "Modules found: 1" (marked in blue on the right).
2. Press the rotary push key several times to clearly identify the radio button that you wish you integrate into the system. These "key presses" will be counted up on the screen. Confirming "Yes" will then integrate the RB into the system.
3. Repeat the above-mentioned process to integrate further RBs into the system.
4. Confirming "Yes" will conclude the search.

The RB will then be ready for further configuration.



■ REDUCING AN EXISTING INSTALLATION

Removing Luminaires

Action/Aim:

Removing luminaires from an existing system.

Luminaires that are no longer needed can be removed from the system by disconnecting them from the DALI bus.

Then run the

Settings ➤ Hardware Search ➤ Luminaire Search menu item to inform the controller that these luminaires have been removed from the system. Failing to run this menu item will lead the controller to identify any removed luminaires as "defective" when performing a system check.

DA

Removing Sensors

Action/Aim:

Removing sensors from an existing system.

Sensors that are no longer needed can be removed from the system by disconnecting them from the DALI bus.

Then run the

Settings ➤ Hardware Search ➤ Sensor Search menu item to inform the controller that these sensors have been removed from the system. Failing to run this menu item will lead the controller to identify any removed sensors as "defective" when performing a system check.

DA

The respective device addresses will then be available again.

■ RESETTING THE SYSTEM AND INDIVIDUAL COMPONENTS

Resetting Luminaires (2.3.1)

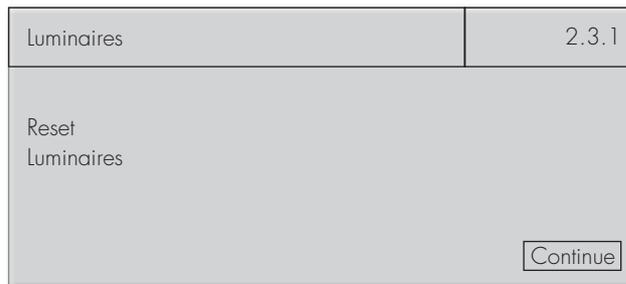
Action/Aim:

Deleting luminaire settings (group assignments).

To this end, please use the rotary push key to select the following menu items on the screen:

Settings ➤ Reset Hardware ➤ Luminaires

Luminaire settings will be reset, but luminaire addresses will be retained.



Resetting RBs (2.3.2)

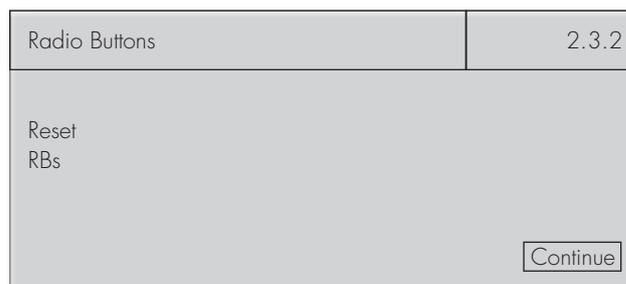
Action/Aim:

Removing RBs (radio buttons) from the system.

To this end, please use the rotary push key to select the following menu items on the screen:

Settings ➤ Reset Hardware ➤ RB

All radio buttons will then be removed from the system.



Reset Special Days (2.3.3)

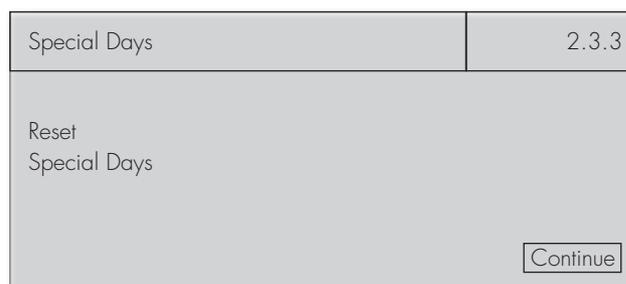
Action/Aim:

Removing manually defined special days under sequence settings.

To this end, please use the rotary push key to select the following menu items on the screen:

Settings ➤ Reset Hardware ➤ Special Days

All special days will then be deleted and the dates affected treated like normal days.



Resetting the System (All) (2.3.4)

Action/Aim:

Restoring the system's default settings.

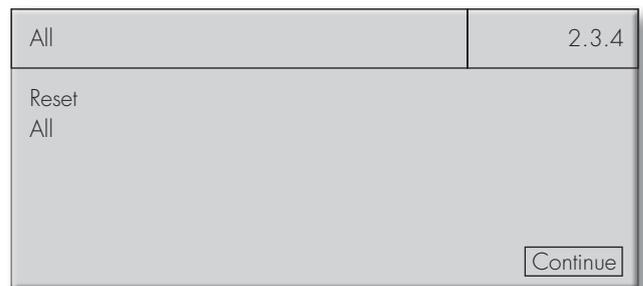
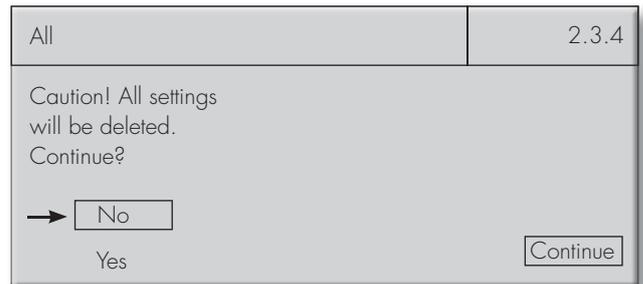
To this end, please use the rotary push key to select the following menu items on the screen:

Settings → Reset Hardware → All

The system will ask whether you want to delete all settings.

The default cursor position is on "No". Deleting all system settings must be confirmed with "Yes".

The system will now be reset.



SYSTEM

LANGUAGE (3)

Action/Aim:

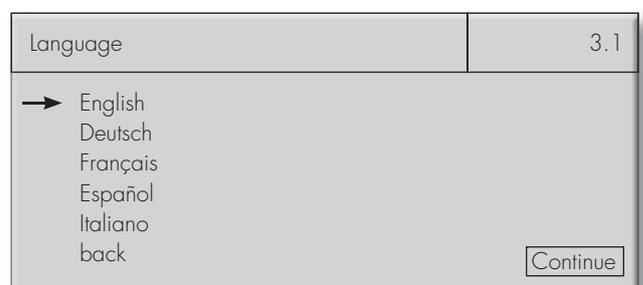
Selecting your preferred language.

To this end, please use the rotary push key to select the following menu items on the screen:

Language

Default setting: English

Select the language you want by "turning and pressing" the rotary push key. Five languages are available.



SCREEN CONTRAST (4)

Action/Aim:

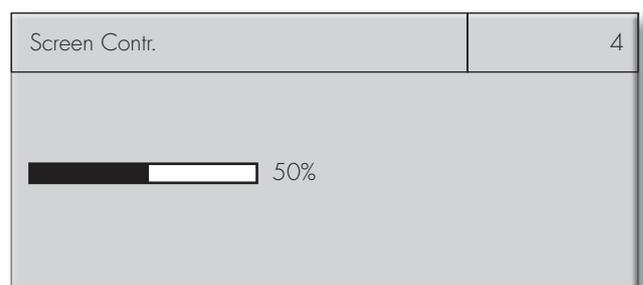
Adjusting the screen contrast.

To this end, please use the rotary push key to select the following menu items on the screen:

Screen Contr.

Default setting: 70%

Select the contrast you want using the rotary push key and "press" to confirm the selected value.



■ SYSTEM CHECK (5)

Action/Aim:

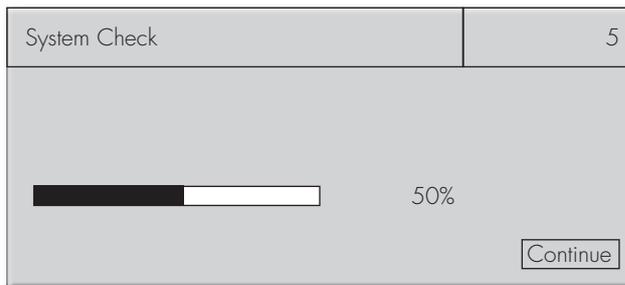
Checking the system for errors.

To this end, please use the rotary push key to select the following menu item:

System Check

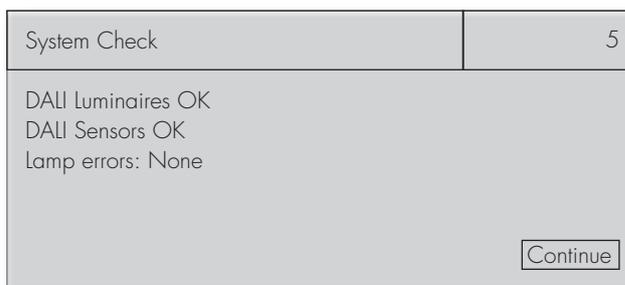
➤ Automatic System Check

An automatic system check will be run.



➤ System OK

No errors found during the system check.



➤ System Errors Found

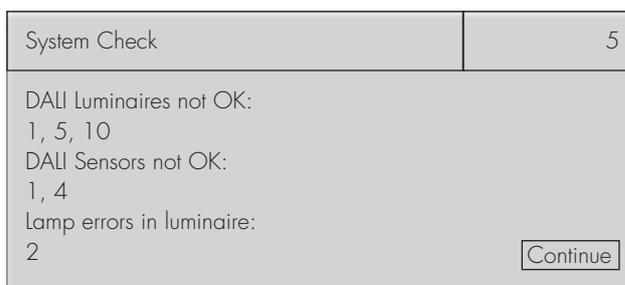
In the example on the right, the system has found detectable errors.

Errors found in DALI luminaires 1, 5, 10.

Errors found in DALI sensors 1, 4.

Error found in lamp 2.

After the system check, the identified components and their wiring should be checked. Depending on the kind of error, the component will have to be exchanged and possibly reconfigured.



■ INFORMATION (6)

Action/Aim:

Displaying system-relevant data regarding the software version.

To this end, please use the rotary push key to select the following menu item on the screen:

Information

Should you encounter any problems with your Light Controller, you will need to provide your VS representative with this information.

DOCUMENTATION

For documentation purposes and to track any later changes, you are recommended to enter your system configuration details in the tables below and to keep these safe for future reference.

The complete tables are available for download as Excel files (.xls) from our website at: www.vossloh-schwabe.com/en/home/services/manuals.html

Group Assignment Table

	Ground Floor Hallway	Ground Floor Office 1	Ground Floor Men's WC
	Group 1	Group 2	Group 3	Group 4	Group 5	Group 6
Luminaire 1						
Luminaire 2						
Luminaire 3						
Luminaire 4						
Luminaire 5						

Table of PB and Sensor Assignments/Settings

Example table:

Which device do you want to control?	Which device do you want to use for control purposes?	How do you want the device to effect control?	Which values are to be used for controlling the group/luminaire?						Switching-on behaviour after a power failure.
			Constant Light	Active LL	Passive LL	Basic LL	Time A	Time B	
Group/Luminaire	PB/RB/Sensor	Mode	Constant Light	Active LL	Passive LL	Basic LL	Time A	Time B	
Group 1	PB 1	Timer	–	100%	50%	0%	10 min	30 s	
Luminaire 3	RB 2/1	Push	–	–	–	–	–	–	
Luminaire 4	RB 2/2	ON/OFF	–	90%	–	–	–	–	

LIGHT CONTROLLER LS AND LSW TECHNICAL DETAILS



■ LIGHT CONTROLLER LS/LSW

Supply voltage.....	220–240 V AC
Frequency.....	50–60 Hz
Power consumption.....	9.0 W
Ambient temperature t_a	5–50 °C
Degree of Protection.....	IP20
Protection Class.....	I
DALI Output (da +-).....	max. 200 mA uptake
No. of DALI ballasts.....	max. 64
No. of VS MultiSensors.....	max. 36
Weight.....	250 g
Dimensions (L x W x H)	126 x 90 x 68 mm

■ LIGHT CONTROLLER LS

Ref. No. 186276

■ LIGHT CONTROLLER LSW

No. of wireless modules (only LSW)..... max. 16
Ref. No. 186276

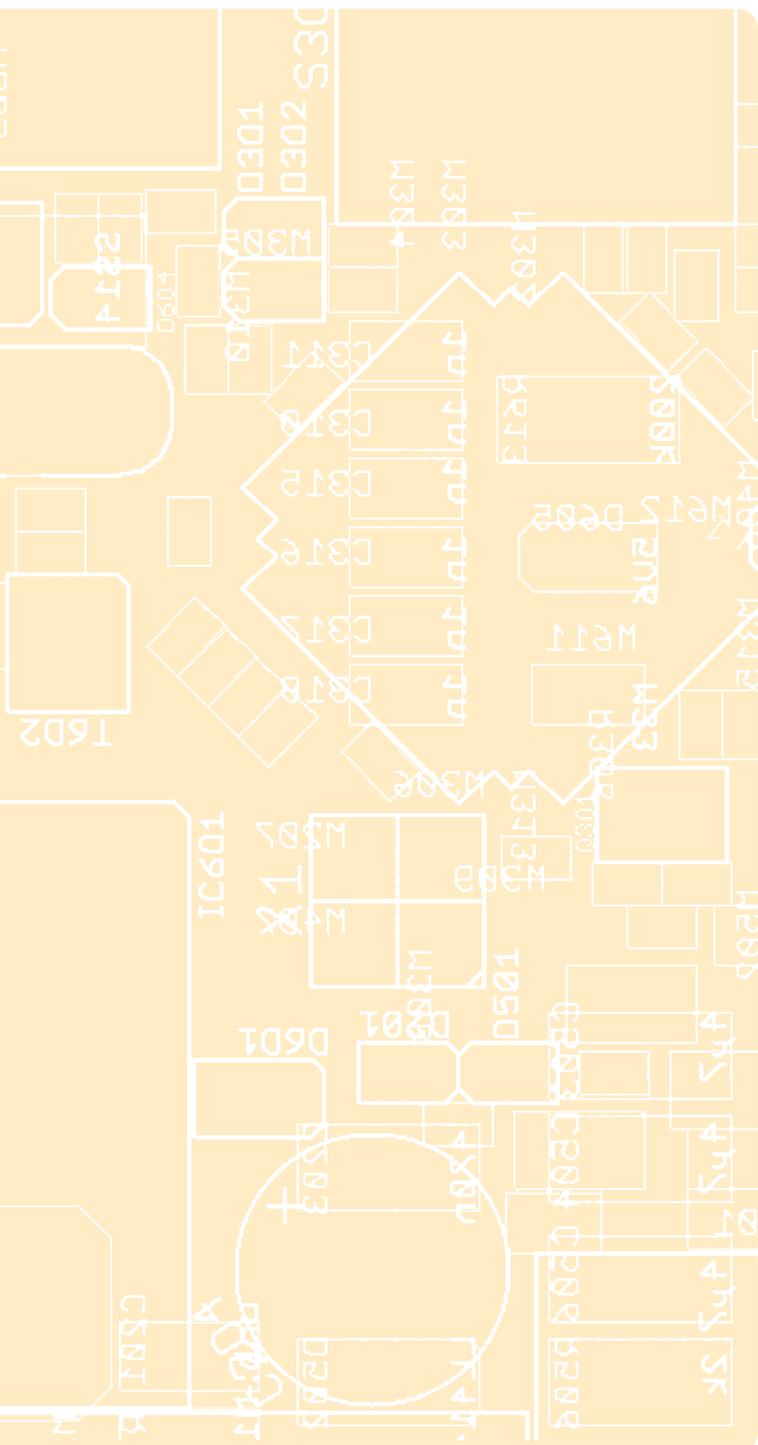
■ MAGNETIC-BASE ANTENNA WITH INTEGRATED CABLE

Cable length and diameter.....	2,500 mm, $\varnothing = 6$ mm
Min. cable bending radius.....	50 mm
Resistance.....	50 Ω
Ambient temperature t_a	-40 °C to +80 °C
Storage temperature.....	-40 °C to +80 °C
Degree of Protection.....	IP66
Weight.....	62 g
Dimensions.....	$\varnothing 29$ mm x 88 mm
Power rating.....	10 W pulsed

Ref. No..... 186211

■ SCREW-BASE ANTENNA WITH SEPARATE CABLE

Cable length and diameter.....	1,500 mm, $\varnothing = 6$ mm
Min. cable bending radius	50 mm
Resistance.....	50 Ω
Ambient temperature t_a	-40 °C to +70 °C
Storage temperature.....	-40 °C to +80 °C





Degree of Protection..... IP66
 Weight of screw-base antenna..... 41 g
 Weight of cable..... 66 g
 Dimensions..... Ø 33 mm x 89 mm
 Power rating..... 8 W pulsed

Ref. No. Antenna..... 186212

Ref. No. Cable 186213

■ **RADIO BUTTON FT4F**

Type: LiCS-LW-FT4F-1
 Description: wireless module, frame, 1 rocker switch and 1 double rocker switch.
 Frame dimensions: exterior: 80 mm x 80 mm, interior: 63 mm x 63 mm, height: 15 mm
 Ref. No./Colours: anthracite 551418, pure white 551416, pure white glossy 551417, painted aluminium 551415
 Weight: 30 g

■ **RADIO BUTTON FT55**

Type: LiCS-LW-FT55-1
 Description: wireless module, frame, 1 rocker switch and 1 double rocker switch
 Frame dimensions: exterior: 80 mm x 80 mm, interior: 55 x 55 mm, height: 15 mm
 Ref. No./Colours: anthracite 551414, pure white 551412, pure white glossy 551413, painted aluminium 551411
 Weight: 30 g

■ **RADIO BUTTON FFT55Q**

Type: LiCS-LW-FFT55Q
 Description: radio module, frame and 1 rocker switch
 Frame dimensions: exterior: 84 mm x 84 mm, interior: 55 mm x 55 mm, height: 11 mm
 Ref. No./Colours: anthracite 551427, pure white 551425, pure white glossy 551426, painted aluminium 551424
 Weight: 30 g

■ **MINI HAND-HELD TRANSMITTER FMH2**

Type: LiCS-LW-FMH2
 Description: 1 rocker switch
 Dimensions: 43 mm x 43 mm
 Height: 16 mm
 Ref. No./Colours: anthracite 551422, pure white 551420, pure

white glossy 551421, painted aluminium 551419
 Weight: 30 g

■ **MINI HAND-HELD TRANSMITTER FMH4**

Type: LiCS-LW-FMH4
 Description: 1 double rocker switch
 Dimensions: 43 mm x 43 mm
 Height: 16 mm
 Ref. No./Colours: anthracite 551410, pure white 551408, pure white glossy 551409, painted aluminium 551407
 Weight: 30 g

■ **WIRELESS REMOTE CONTROL FF8**

Type: LiCS-LW-FF8
 Description: 2 double rocker switches
 Dimensions: 185 mm x 50 mm
 Height: 17 mm
 Ref. No./Colour: painted aluminium 551423
 Weight: 140 g

■ **WIRELESS REPEATER FRP61-230 V**

Type: LiCS-LW-FRP61-230V
 Description: for flush-mounted installation
 Ref. No.: 551606
 Voltage: 230 V
 Standby loss: 0.8 W
 Dimensions: 45mm x 55mm x 33 mm
 Weight: 50 g

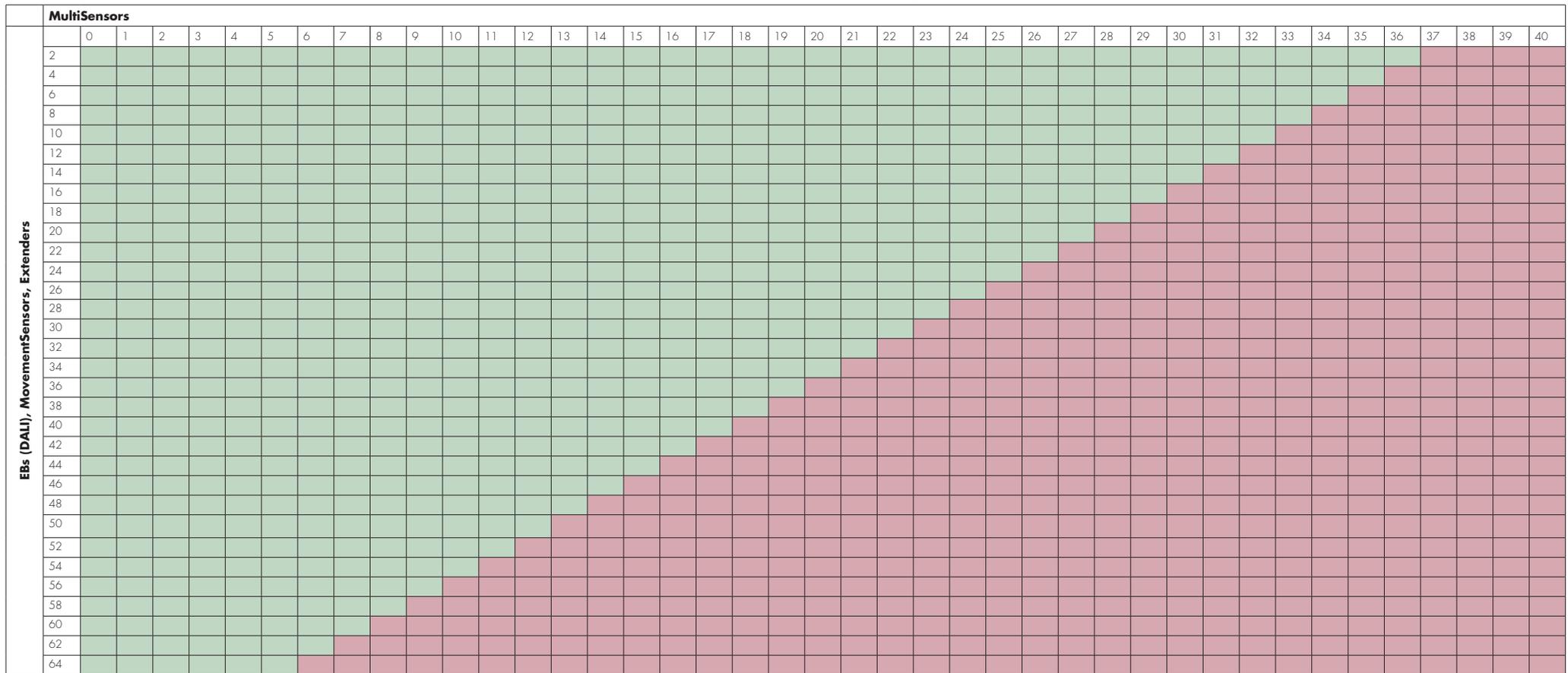
■ **WIRELESS REPEATER FRP61/8-24 V UC**

Type: LiCS-LW-FRP61/8-24V UC
 Description: for flush-mounted installation
 Ref. No.: 551607
 Voltage: 8-24 V UC
 Standby loss: 0.3 (8 V), 0.5 (12 V), 1 (24 V)
 Dimensions: 45 mm x 55 mm x 18 mm
 Weight: 50 g

LIGHT CONTROLLER LS AND LSW APPENDIX



■ Maximum Number of DALI Components for a Light Controller



■ Safe Zone ■ Impermissible Zone

LIGHT CONTROLLER LS AND LSW

APPENDIX



■ PUBLIC HOLIDAYS

	New Year's Day (1st January)	Epiphany (6th January)	Maundy Thursday	Good Friday	Easter Sunday	Easter Monday	Labour Day (1st May)	Ascension Day	Whit Sunday	Whit Monday	Corpus Christi	Assumption of Mary	All Saints' Day (1st November)	Immaculate Conception (8th December)	Christmas Eve (24th December)	Christmas Day (25th December)	Boxing Day (26th December)	New Year's Eve (31st December)
Germany	x			x	x	x	x	x	x	x						x	x	
Austria	x	x			x	x	x	x	x	x	x	x	x	x		x	x	
Czech Republic	x				x	x	x								x	x	x	
Denmark	x		x	x		x		x		x					x	x	x	
Finland	x	x		x		x	x	x					x			x	x	
France	x			x	x	x	x	x	x	x		x	x			x	x	
Italy	x	x			x	x	x		x	x		x	x	x		x	x	
Poland	x	x				x	x		x	x		x	x			x	x	
Portugal	x					x	x					x	x	x		x		
Slovakia	x	x		x		x	x						x		x	x	x	
Slovenia	x					x	x					x	x			x	x	
Spain	x	x		x	x	x	x	x					x	x		x	x	
UK	x			x	x	x										x	x	
Switzerland	x						x	x									x	
Chile	x			x			x					x	x	x		x		
Argentina	x			x			x											
Paraguay	x		x	x												x		
Australia	x			x		x										x	x	
New Zealand	x			x		x										x	x	
South Africa	x			x		x	x									x	x	
Russia	x						x											x

LIGHT CONTROLLER LS AND LSW

APPENDIX



■ FURTHER PUBLIC HOLIDAYS

Further Public and National Holidays									
Germany	3rd October								
Austria	26th October								
Czech Republic	8th May	5th July	6th July	28th September	2nd October	12th November			
Finland	6th December								
France	8th May	14th July	11th November						
Italy	25th April	2nd June							
Poland	3rd May	11th November							
Portugal	25th April	10th June	5th October	1st December					
Slovakia	8th May	5th July	29th August	1st September	15th September	17th November			
Slovenia	8th February	27th April	25th June	31st October					
Spain	12th October	6th December							
UK	May Bank Holiday (first Monday in May)	25th May							
Switzerland	1st August								
Chile	21st May	2nd July	16th July	18th September	19th September	15th October	2nd November		
Argentina	24th March	2nd April	5th April	25th May	18th June	9th July			
Paraguay	1st March	15th May	12th June	15th August	29th September	8th December			
Australia	26th January	25th April	11th June	1st August	3rd October				
New Zealand	2nd January	6th February	25th May	4th June	22nd October				
South Africa	2nd January	21st March	27th April	16th June	9th August	24th September	16th December	17th December	
Russia	2nd January	3rd January	4th January	5th January	23rd February	8th March	9th May	12th June	4th November

Whenever an electric light goes on around the world, Vossloh-Schwabe is likely to have made a key contribution to ensuring that everything works at the flick of a switch.

Headquartered in Germany, Vossloh-Schwabe has been a member of the global Panasonic group since 2002 and counts as a technology leader within the lighting sector. Top-quality, high-performance products form the basis of the company's success.

Whether cost-effective standard components or tailor-made product developments are needed, Vossloh-Schwabe can satisfy even the most diverse market and customer requirements. Vossloh-Schwabe's extensive product portfolio covers all lighting components: LED systems with matching control gear units, state-of-the-art control systems (LiCS) as well as electronic and magnetic ballasts and lampholders.

A member of the Panasonic group **Panasonic**

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