User Manual

LON DALI Controller DR-S 4DIM

Art. No.:MTN887241

Content

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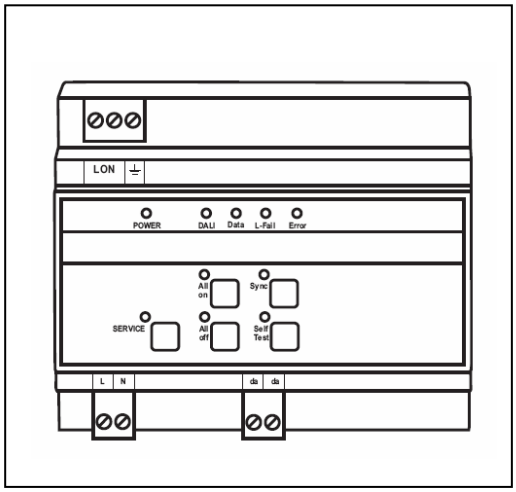
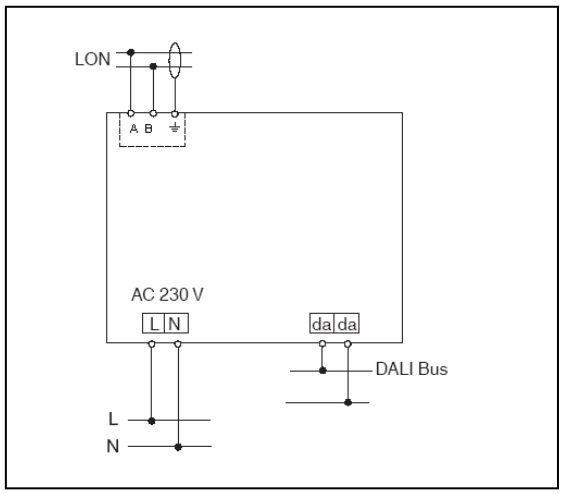


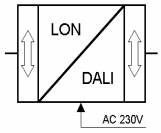


FTT | 230V | SPI

1. Description

- control and supply of up to 64 DALI devices, divided into up to four groups
- addressing of the DALI system with LNS plug-in
- provides DALI supply voltage, 16 V
- status monitoring of all connected DALI devices
- monitoring of all lamps (if DALI compatible)
- status LEDs for diagnostics and status indication
- manual operation for direct control of DALI devices
- DALI device replacement with manual operation
- pluggable screw-type terminals
- supply voltage: AC 230 V
- mounting on DIN-rail TH 35 according to EN 60 715
- width of device: approx. 105 mm (6 pitch)
- software application for control of up to 64 DALI devices, divided into four groups including timers, prioritized control and configurable reaction to power-down/power-up/bus reset. Furthermore, the application provides constant light and scene control according to LonMark profile “Lamp Actuator (3040)”, “Constant Light Controller (3050)” and scene control in the DALI devices.

2. Function



The LON DALI-Controller DR-S 4DIM provides a DALI output by which up to 64 devices, divided into 4 groups can be controlled.
To operate the device a supply voltage of AC 230 V is needed. The DALI bus voltage DC 16 V is generated by the device itself.

The current state of the LON DALI-Controller is indicated by the status LEDs. The control buttons on the casing provide direct control of the connected DALI devices.
The general state of the device is indicated by the power and service LEDs.
The software application is based on the LonMark profiles.

3. Mounting

The DALI-Controller has been designed as a device for mounting on DIN-rail TH 35 according to EN 60 715.
The bus cables, power supply cables and cables of the consumer loads/lamps are connected to the device by pluggable screw-type terminals. To simplify the mounting, the cables can be screwed to the unplugged terminals at first and the terminals can then be plugged into the fitted device.
All devices mounted next to the DALI-Controller have to be at least fitted with a basic insulation.
The green power LED does not shine until an appropriate application program has been loaded into the device.
By pushing the service pin, the DALI-Controller is initiated to propagate its Neuron ID. The service LED shows the state of programming.

4. Remarks

Electrical devices may only be fitted and mounted by a skilled person.
For planning and building electrical systems the relevant standards, guidelines, regulations and requirements of the particular country have to be considered. In addition to that, the device-specific instructions have to be considered as well. For project planning, mounting and commissioning, detailed knowledge about the LON technology is assumed.
The device's function depends on the applied software. Only application programs that are approved for this device may be loaded.
The builder of the LON system has to assure that the loaded application program and the configured parameters accord to the external circuit elements, especially if several programs for various applications are available for one device.

5. Technical Data

Power supply	
Supply voltage:	AC 230 V
Input power:	max. 22 mA
Network interface	
Transceiver type:	LON Free Topology Transceiver (TP/FT-10)
Outputs	
Number:	1 (da) meets the DALI specifications of the ZVEI
Type:	DALI interface
DALI network voltage:	DC 16 V (basic isolation, not SELV)
DALI output current:	max. 125 mA
Number of DALI devices:	max. 64
Controls	
Service pin:	Propagates the Neuron-ID
ALL on:	To switch on all connected DALI devices
ALL off:	To switch off all connected DALI devices
Sync:	To adjust DALI devices to the LON network
Test:	To test the DALI interface, the connected DALI devices and all lamps (if DALI compatible)
Indicators	
Power LED:	lit: operating power-on, module configured
Service LED:	lit: network access error flashes: module unconfigured
DALI LED:	lit: DALI interface ready for operation
Data LED:	lit: Transmission on the DALI bus
L-Fail LED:	lit: Minimum one damaged lamp
Error LED:	lit: DALI bus failure
All on LED:	lit: DALI devices have been switched on locally
All off LED:	lit: DALI devices have been switched off locally
Sync LED:	lit: The DALI Controller synchronises with the LON network
Self Test LED:	lit: The DALI interface is tested
Connections	
Power supply, DALI output, bus:	pluggable screw-type terminal arrangement in a 0.5 .. 2.5 mm² grid (single-core cable)
Housing	
Dimensions:	86 x 105 x 58 mm (H x W x D), 6 pitch
Protection class:	IP20
Site conditions	
Operating temperature:	-5 °C .. +45 °C
Max. humidity:	93 % relative humidity without moisture condensation
EC guidelines	
Low-voltage guideline:	2006/95/EEC
EMC directive:	2004/108/EEC

-6. Application description

The application "887241LC04d" is used for dimming and switching up to 64 DALI devices, split into 4 groups.

The four integrated daylight-dependent controllers can each control two lighting groups. The current controller values can be set from indoor or outdoor brightness sensors with a LON interface.

The application supports extended analysis of lamp failure messages from the DALI devices. These can be output commonly, as groups, or for the exact individual device. You can also analyse the proportion of faulty lamps in an affected group. Lamps used for emergency lighting can be checked and monitored separately from the assigned group.

Up to 16 lighting scenes can be stored and called up as required. LON scene panels can be used to rapidly restore particular lighting moods.

Central commands can also be analysed. Separate scene storage is provided for this, allowing (e.g.) implementation of night time effects.

The following LonMark objects are provided: "Node (#0)", "Lamp Actuator (#3040)" (4x), "Constant Light Controller (#3050)" (4x), "DALI Scene Controller (#3)" (4x) and "Global Control (#3)" (1x).

The configuration of the DALI system is done using Schneider LON DALI Controller LNS plug-in. The DALI devices found in a random order can be named and assigned to the 4 groups.
Combined with OSRAM ***i*** DALI devices (QTi, HTi ...) and LNS 3, "Offline" commissioning with serial numbers and barcodes is supported. The device buttons can be used for swapping faulty DALI devices at any time.

The plug-in automatically generates an optimised dimming characteristic line in `UCPTAdaptationTable[i]`.
The other application parameters can be conveniently edited using the Schneider Universal LNS plug-in (UPI).

System requirements

A LNS-compatible start up tool is required for the configuration of the application! "User-defined configuration property types" (UCPTs) are used as parameters in the DirectMemoryAccess. To be able to use the parameters, the Schneider device resource files (DRFs) need to be installed **before (!)** creating a device template.

For commissioning the DALI system, the LON DALI Controller plug-in from version 2.2 or higher is required. The objects can be configured using the Universal plug-in.

The used LNS must be version 2.0 or higher.

Programming the DALI devices without an LNS tool

(Print this page and store it with the device!)

When expanding the system, swapping faulty devices, or changing the group assignments, the addressing and group assignments can be changed independently of LNS by using the buttons on the LON DALI Controller.

1. Preconditions
   - The system has first been commissioned using the LON DALI Controller plug-in.
   - The DALI groups can be individually controlled via LON.

2. Preparation
   - Modify the DALI plant as desired (replace/add DALI devices).
   - Ensure that all DALI devices are ready for operation, including the lamps. This can be automatically checked using the "Self Test" button. This checks the DALI cabling and all connected DALI devices. The test is passed when neither the "L-Fail" nor the "Error" LEDs illuminate after the test.

3. Begin programming
   - Press and hold the "Sync" button for 3 seconds until the "Error" LED blinks twice and the "Sync" LED goes out.
   - The lamps on all DALI devices switch on.
   - After a short time the "Sync" LED begins to blink rapidly (0.4 s). If this does not happen, then at least one of the DALI devices is faulty or more than 64 DALI devices are connected.

4. Select the DALI device to be modified
   - While operating, briefly remove the relevant lamp (min 5 seconds).
   - The selection is confirmed when the lamp subsequently blinks once per second.
   - The "Sync" LED also blinks once per second.

5. Program the group membership
   - Operate the desired group using the LON control element.
   - The DALI device is now automatically assigned to this group.
   - The LON DALI Controller switches back to normal operation.

6. If further modifications are required, then repeat the process beginning at step 2.

Additional notes:

- The programming process can be interrupted at any time by pressing any device button.
- If new devices are logged by this procedure, then these do not automatically appear in the "LON DALI Controller plug-in" but must be loaded into the LNS database using "Device Search", in order to synchronise this with the LON network (this can be done by a system integrator during maintenance).
- A new group membership is directly displayed in the "LON DALI Controller plug-in".
- When swapping DALI devices, an attempt is made to retain the old device names. This can lead to confusion if more than one device is swapped at the same time.
- Only devices of one type should belong to a given group, since DALI devices with different characteristic lines may cause synchronisation problems when dimming.

Function

The device functions are split into the LonMark® objects described in the following paragraphs:

6.1 Node object

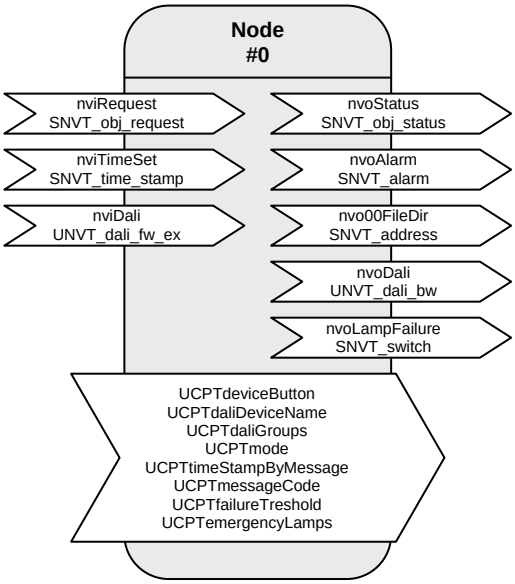


Table: Functions, parameters, and variables of the node object

Function	Network variable	Type
Object status queries	nviRequest	SNVT_obj_request
Object status outputs	nvoStatus	SNVT_obj_status
Time values for alarm messages	nviTimeSet	SNVT_time_stamp
Alarm messages for logging	nvoAlarm	SNVT_alarm
Address of the configuration parameter	nvo00FileDir	SNVT_address
DALI plug-in interface	nviDali	UNVT_dali_fw_ex
DALI plug-in interface	nvoDali	UNVT_dali_bw
Lamp failure collective message	nvoLampFailure	SNVT_switch
Function	**Configuration parameters**	**Type**
Device buttons	UCPTdeviceButton	UNVT_enabled
DALI device names	UCPTdaliDeviceName	UNVT_str_asc_15
DALI groups	UCPTdaliGroups	SNVT_state
Operating mode	UCPTmode	SNVT_state
Timestamp without "binding"	UCPTtimeStampByMessage	UNVT_enabled
'Explicit Message' identification code	UCPTmessageCode	UNVT_message_code
Fault limit	UCPTfailureTreshold	SNVT_lev_cont
Emergency lighting lamps	UCPTemergencyLamps	SNVT_state_64

Lamp faults and fault messages

If a lamp fault is detected by a device on the DALI cable, then this is notified via the network variable `nvoLampFailure = {100,0 1}`and the "L-Fail" LED.

The network variable `nvoAlarm` can also be written at the same time to provide detailed information on the nature of the fault. This contains the following data:

nvoAlarm.location	:	Mounting location of the LON DALI Controller as a 6 byte location ID.
nvoAlarm.object_id	:	object_id of the LA object having a lamp fault.
nvoAlarm.alarm_type	:	AL_NO_CONDITION = Alarm removed; AL_WARNING = Fault proportion below the critical threshold; AL_ERROR = Fault proportion above the critical threshold; AL_FATAL_ERROR = Emergency lighting faulty.
nvoAlarm.value[0]	:	Group address of the newly affected DALI EVGs
nvoAlarm.value[1]	:	Index of the newly affected DALI EVGs (255 = not yet determined)
nvoAlarm.value[2]	:	Device status; 1 = Status not OK; 2 = Lamp fault; 245 = DALI cable occupied for too long; 250 = DALI short circuit ; 254 = DALI device does not answer
nvoAlarm.value[3]	:	Proportion of faults in the affected group in 0...200 -> 0...100% (0 when not yet determined)
nvoAlarm.alarm_limit[0]:		Alarm counter, counts the emitted messages. Begins at zero after 255 messages. If nvoAlarm is cyclically polled then this value can be used to define whether alarm messages are recorded.

A cyclic time telegram to the input **`nviTimeSet`** or broadcast messages from a system clock can be used to provide the messages at the **`nvoAlarm`** output with a timestamp of the actual time. The internal clock has an accuracy of ±1 %.

When all lamps in a group function once more, the alarm is removed using nvoAlarm.alarm_type = AL_NO_CONDITION.

The alarm types can be influenced using the parameters **`UCPTfailureTreshold`** and **`UCPTemergencyLamps`**.

`nviRequest` can be used to repeat the output of the current fault messages of individual objects (RQ_UPDATE_ALARM).
Lamps designated as emergency lighting can be separately tested using this input. (RQ_OVERRIDE / RQ_RMV_OVERRIDE)

All devices together, a group, and an individual device are tested approximately every two seconds. This makes the collective fault message via **`nvoLampFailure`** current within 2 seconds. A group fault message occurs with **`nvoAlarm.value[2] = 255.`** Up to 3 minutes can pass until the index of the affected device is displayed. The group fault messages can be suppressed by setting **`UCPTmode.bit0 = 1`**.

Energy saving mode

When all lamps on the LON DALI Controller are switched off (the "All off" LED illuminates) and no lamp failure has been reported, the test and the continuous sending of the current dimming value is interrupted so that the DALI devices can switch to the energy saving mode. However, this can be suppressed by setting **`UCPTmode.bit1 = 1`**.

Input variables

`nviRequest` – Object status queries

Type	SNVT_obj_request
Value range	Valid object id together with RQ_NORMAL, RQ_UPDATE_STATUS, RQ_REPORT_MASK, RQ_UPDATE_ALARM, RQ_OVERRIDE, RQ_RMV_OVERRIDE
Default value	0, RQ_NORMAL
Description	Input used to initiate the node status functions: 0, RQ_NORMAL All brightness values are synchronised with the LON input values, reflects the "Sync" button on the front of the device. 1-4, RQ_NORMAL The brightness value of the specified channel is synchronised with the LON input value. 0, RQ_SELF_TEST An internal self-test LON DALI Controller is performed, during the tests all status LEDs and lamps are briefly switched on, and once the test is finished the controller is returned to the starting state, reflects the "Self Test" device button. 0-4, RQ_UPDATE_ALARM The last alarm message for the specified object is repeated. 0, RQ_OVERRIDE The devices marked as emergency lighting are switched on. 0 RQ_RMV_OVERRIDE The devices marked as emergency lighting are switched off.

`nviTimeSet` – Time values for alarm messages

Type	SNVT_time_stamp
Value range	.year: -1 ... 3.000 .month: 0 ... 12 .day: 0 ... 31 .hour: 0 ... 23 .minute: 0 ... 59 .second: 0 ... 59
Default value	.year = 0 .month = 0 .day = 0 .hour = 0 .minute = 0 .second = 0
Description	Input for synchronising the internal clock. For alarm messages, the time is output with `nvoAlarm`.

Input variables

`nviDaliEx` – DALI plugin interface

Type	UNVT_dali_fw_ex
Value range	0x000000 ... 0xffffff
Default value	0x000000
Description	Interface for the LON DALI Controller plugin, required exclusively for internal functionality and may not be bound!

Output variables

`nvoStatus` – Object status output

Type	SNVT_obj_status
Value range	The status bits supported by the object: .report_mask, .invalid_id, .invalid_request .in_override
Default value	All bits = 0
Description	Sends the result of a query via `nviRequest`

`nvoAlarm` – Object status output

Type	SNVT_alarm	
Value range	.location[6]:	0x00 ... 0xff (Location string)
	.object_id:	1 ... 4
	.alarm_type:	AL_NO_CONDITION, AL_WARNING; AL_ERROR; AL_FATAL_ERROR
	.priority_level:	PR_LEVEL_0
	.index_to_SNVT:	0
	.value[0]:	0 ... 15 (DALI group address)
	.value[1]:	0 ... 64; 255 (DALI shortaddress)
	.value[2]:	0 ... 255 (device status)
	.value[3]:	0 ... 200 (0 ... 100% proportion of affected devices)
	.year:	-1 ... 3.000
	.month:	0 ... 12
	.day:	0 ... 31
	.hour:	0 ... 23
	.minute:	0 ... 59
	.second:	0 ... 59
	.milisecond:	0 ... 999
	.alarm_limit[0]:	0 ... 255 (alarm number, distinguishing poll characteristic)
	.alarm_limit[1]:	0
	.alarm_limit[2]:	0
	.alarm_limit[3]:	0
Default value	All elements = 0	
Description	This output can be logged to provide exact details of lamp faults. The interpretation of the values is described above.	

Output variables

nvo00FileDir – Address of the configuration parameter

Type	SNVT_address
Value range	0x0000 ... 0xffff
Default value	0x0000
Description	Is required exclusively for internal functionality.

nvoDali – Plug-in interface

Type	UNVT_dali_bw
Value range	0x0000 ... 0xffff
Default value	Application-dependent
Description	Interface for the LON DALI Controller plug-in, required exclusively for internal functionality and may not be bound!

nvoLampFailure – Lamp failure collective message

Type	SNVT_switch
Value range	.value: 0; 100 % .state: 0; 1
Default value	.value = 0 .state = 0
Description	This output emits {100,1} when at least one lamp is recognised as faulty. Details of the fault can be taken from nvoAlarm. Fault-free DALI hardware is indicated by {0,0}.

Configuration parameters

UCPTdeviceButton – Device buttons

Type	UNVT_enabled
Value range	ENABLED, DISABLED
Default value	ENABLED
Description	For deactivating the device buttons.

UCPTdaliDeviceName - DALI device names

Type	UNVT_str_asc_15
Value range	ascii
Default value	not in use
Description	Individual name for each DALI device. (do not modify!)

Configuration parameters

UCPTdaliGroups - DALI groups

Type	SNVT_state
Value range	0, 1
Default value	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
Description	Dali group information for internal management. (do not directly modify!)

UCPTmode – Operating mode

Type	SNVT_mode
Value range	0, 1
Default value	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
Description	Individual device properties can be switched on and off. .bit0 = 1: Alarm messages without a device index are not output. .bit1 = 1: No energy saving mode for "All off" .bit2 = 1: No continuous repetition of the current dimming value

UCPTtimeStampByMessage - Time stamp without 'binding'

Type	UNVT_enabled
Value range	DISABLED, ENABLED
Default value	ENABLED
Description	The timestamp is sent/received as 'Explicit Message' (broadcast) without network variable linking.

UCPTmessageCode - 'Explicit Message' identification code

Type	UNVT_message_code
Value range	0 ... 62 [1]
Default value	43
Description	'Explicit Message' identification code. This code must be set identically for the sender and transmitter.

UCPTfailureTreshold - Failure limit

Type	SNVT_lev_cont
Value range	0.0 ... 100.0 % [0.5 %]
Default value	0.0 %
Description	If the number of faulty lamps in a group is more than the percent value specified here, then a fault message instead of a warning is output.

Configuration parameters

UCPTemergencyLamps - Emergency lighting lamps

Type	SNVT_state_64
Value range	0, 1
Default value	All bits 0
Description	The lamps marked here are treated as emergency lighting.

6.2 LampActuator

DALI Group (Index = 0 ... 3)

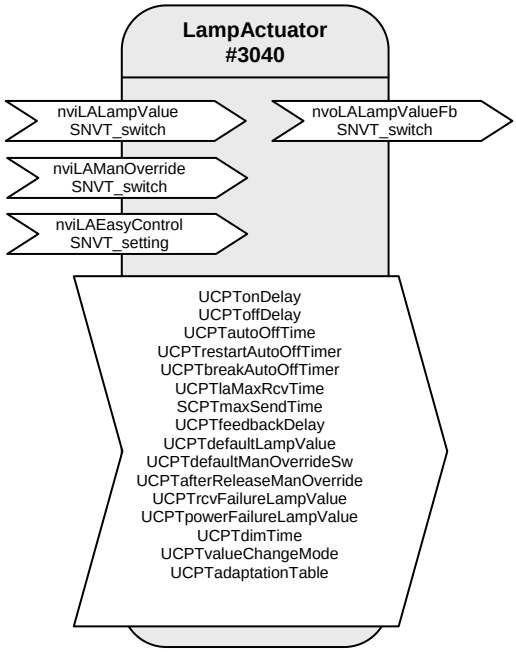


Table: Functions, parameters, and variables of the LampActuator object

Function	Network variable	Type
Lamp input value	nviLALampValue	SNVT_switch
Lamp feedback output	nvoLALampValueFb	SNVT_switch
Priority input	nviLAManOverride	SNVT_switch
Advanced lamp input	nviLAEasyControl	SNVT_setting
Function	**Configuration parameters**	**Type**
Switch-on delay	UCPTonDelay	UNVT_time_sec
Switch-off delay	UCPToffDelay	UNVT_time_sec
Automatic switch-off time	UCPTautoOffTime	UNVT_time_sec
Automatic switch-off time extendable	UCPTrestartAutoOffTimer	UNVT_boolean
Automatic switch-off time interruptible	UCPTbreakAutoOffTimer	UNVT_boolean
Maximum reception pause	UCPTlaMaxRcvTime	SNVT_time_sec
Maximum transmission pause	SCPTmaxSendTime	SNVT_time_sec
Feedback delay	UCPTfeedbackDelay	UNVT_time_msec
Default lamp value	UCPTdefaultLampValue	SNVT_switch
Default value override	UCPTdefaultManOverrideSw	SNVT_switch
Override after release	UCPTafterReleaseManOverride	UNVT_switch_cfg
Lamp value when reception faulty	UCPTrcvFailureLampValue	SNVT_switch
Lamp value when power failure	UCPTpowerFailureLampValue	SNVT_switch
Total dimming time	UCPTdimTime	SNVT_time_sec
Fading times	UCPTvalueChangeMode	UNVT_change_md
Adaptation table	UCPTadaptationTable	UNVT_adapt_tbl

The "Lamp Actuator" objects represent the DALI groups in LON.

Every "Lamp Actuator" object has a normal and also a prioritised switch input for controlling the appropriate group. The function range is expanded by a setting input that allows relative brightness control, among other uses.

Different time functions, such as switch-on and switch-off delays, automatic switch-off (stairwell function), and feedback delays can all be set using parameters. The reaction to different power supply events (loss of power, power switch-on, restart) is also configurable.

Functions

Switching (with time functions)

Normally, the associated output is switched via the switch input variable `nviLALampValue[i]`. A switch-on delay can be set for this output using the `UCPTonDelay[i]` variable, a switch-off delay can be set using `UCPToffDelay[i]`, and automatic switch-off (stairwell function) can be set using `UCPTautoOffTime[i]`. If automatic switch-off is running, then the parameter `UCPTrestartAutoOffTimer[i]` can be set to define whether this period may be extended or not and `UCPTbreakAutoOffTimer[i]` can be used to defined whether it may be interrupted.

Dimming (with Easy Control)

As well as LonMark, the switch input variable `nviLALampValue[i]` is also intended for dimming.

For devices with dimming features, Schneider Electric offers the setting input variable `nviLAEasyControl[i]`, which allows relative brightness changes and switching on with stored values (memory function).
Using `.function = SET_UP` or `.function = SET_DOWN` the lighting is dimmed relative to the value in `.setting`. The `.function = SET_STOP` can be used to prematurely interrupt the process.
When switching off using `.function = SET_OFF`, the last brightness value is stored and then output again the next time a switch-on occurs via `.function = SET_ON` (memory function).

When using the "Easy Control" function, the dimming time over the entire brightness range from 0 to 100 % can be defined in the parameter `UCPTdimTime[i]`.
The parameter `UCPTvalueChangeMode[i]` can be used to individually define "Dimming on" (`.SoftOn`), "Dimming off" (`.SoftOff`), and "Fade to new dimming value" (`.SoftChange`) (e.g. for scene changes in a scene control).

To reduce bus loading, a delay time between reception of a command and sending of the feedback can be set in the parameter `UCPTfeedbackDelay[i]`. This means that the output feedback value is not unnecessarily sent for every dim telegram, but rather via the output variable `nvoLALampValueFb[i]` when dimming is finished.

Example: Switching/Dimming using a button sensor

- Short button push: Alternates between SET_ON and SET_OFF. The actuator switches between the temporarily stored brightness value (memory value) and off.
- Longer button push: {SET_UP; 100 %; x[*]} or {SET_DOWN; 100 %; x}, on release SET_STOP. The actuator dims in the specified direction using the time specified in `UCPTdimTime[i]`. SET_STOP interrupts the dimming process and the current brightness level is temporarily stored.

[*] x = is ineffective, default setting can be retained.

Brightness-dependent control of multiple switching/dimming actuators

The "Lamp Actuator" object allows control of multiple switching/dimming actuators based on a common brightness value.
A percentage brightness value, e.g. from a constant light regulator or a GLT, is specified via the inputs `nviLALampValue[i]`. Local switch-off, or switching on to this lighting value, is done via the input `nviLAEasyControl[i]`.

When switching off using `nviLAEasyControl[i].function` = SET_OFF, the last brightness value is stored and then output again the next time a switch-on occurs via `.function` = SET_ON (memory function). If a new brightness value is specified via `nviLALampValue[i]` while in a switched off state, the memory value is changed. This new value is then output at the next switch-on.

If an invalid value exists at `nviLALampValue[i]` (`.state` = -1) then control is done via the input `nviLAEasyControl[i]`. The reverse is also true, when `nviLAEasyControl[i].function` = SET_NUL (but only when!), then the lighting is controlled by `nviLALampValue[i]`.
When the lighting is switched off, `nviLALampValue[i]` is the same as the memory value. After a reset, or if an invalid value exists at `nviLALampValue[i]` when the lights are switched off, the memory value is 100 %, so that the lights can be switched on again if necessary.

The lighting can be locally dimmed up (SET_UP) or down (SET_DOWN) via `nviLAEasyControl[i]`. This creates an offset that is carried over to `nviLALampValue[i]` when a new brightness value is specified.
If a locally selected brightness value (without an offset by the control system), then `nviLAEasyControl[i]` must be set using `.function` = SET_STATE (e.g. to call up scene values). The input `nviLALampValue[i]` is deactivated during SET_STATE commands.
If the valid brightness range is exceeded through the offset calculations, the brightness is set to 0.5 or 100 %. The offset overhang is internally stored and retained for brightness control via `nviLALampValue[i]`. For local brightness changes via `nviLAEasyControl[i]` a new offset is generated each time – based on the actual brightness value.

Global/Effect control

The values from the "GlobalCtrl" object override with the priority of the LampActuator object. Commands with a priority of 0 are only accepted when nviLAlampValue is invalid (.state = -1).

For example, if a "Night effect" is to be implements, the parameter UCPTctrlOffOutput of the Constant Light Controller can be set so that an invalid value is output when absent. This leads to the effect value of the Global Controller being adopted when nobody is in the room.

Safety functions

The value to which the DALI devices are dimmed after a restart of the DALI controller is defined in parameter `UCPTdefaultLampValue[i]`. This is also additionally directly stored in the DALI devices but may not be zero there. If the DALI devices receive power before the DALI controller comes online, then the DALI devices switch to their minimum brightness when `UCPTdefaultLampValue[i]` = 0.

The value `UCPTpowerFailureLampValue[i]` is also transferred to the DALI devices and is adopted when the power supply of the DALI controller fails or the DALI cabling is damaged.

The parameter `SCPTlaMaxRcvTime[i]` is required for reception monitoring. If the appropriate "Lamp Actuator" input is not updated within the time specified here, then it is assumed that a transmission fault exists. The actuator then adopts the state specified in the parameter `UCPTrcvFailureLampValue[i]`.

The output `nvoLALampValueFb[i]` can be cyclically sent over the period specified in `SCPTmaxSendTime[i]`. This allows the functioning of the DALI controller to be monitored with another LON device.

Input variables

nviLALampValue - Lamp input value

Type	SNVT_switch
Value range	.value: 0 ... 100 % .state: 0, 1, -1 ON: .state = 1 and .value > 0 OFF: .state = 0 or .state = 1 and .value = 0
Default value	UCPTdefaultLampValue[i]
Description	Control input for switching and dimming the DALI groups.

nviLAManOverride - Priority input

Type	SNVT_switch
Range	.value: 0 .. 100 % .state: 0, 1, -1 On: .state = 1 and .value > 0 Off: .state = 0 and .value = any or .state = 1 and .value = 0 Disabled: .state = -1
Default	Value of UCPTdefaultManOverrideSw[i]
Description	By default (when UCPTlogicFunction[i].function = LF_OVERRIDE), this input controls the corresponding hardware output with higher priority than nviLAlampValue[i]. Messages received via this input control the corresponding output directly (without timers). To release the output for other commands, the .state field of this input has to be set at -1 (undefined). The output then adopts the position defined in UCPTafterReleaseManOverride[i]. This input has the same priority as the prioritised group control input (node object). If the output is controlled via the group control input (node object), this input is updated as well.

nviLAEasyControl – Advanced lamp input

Type	SNVT_setting
Value range	.function: SET_OFF, SET_ON, SET_UP, SET_DOWN, SET_STATE .setting: 0 ... 100 %
Default value	.function = SET_NUL .setting = 0
Description	The input is used for controlling an output via SNVT_setting. If this input is bound to nviLALampValue[i], then it is used for switching and changing the default value stored there (e.g. a regulator/controller).

SET_STATE:	The .setting portion is interpreted in the same manner as the .value portion of a switch input and directly jumped to or travelled to depending on further parameter values.
SET_UP, SET_DOWN:	The output is relatively dimmed by the .setting proportion of the specified value in the specified direction.
SET_STOP:	A running dimming process is stopped.
SET_OFF:	The output is switched off and the last switch-on value is temporarily stored.
SET_ON:	The output is switched on with the last stored value.
SET_NUL:	Release for controlling via nviLALampValue[i].

Output variables

nvoLALampValueFb - Lamp feedback output

Type	SNVT_switch
Value range	.value: 0 ... 100 % .state: 0, 1, -1 ON: .state = 1 and .value > 0 OFF: .state = 0 or .state = 1 and .value = 0
Default value	UCPTdefaultLampValue[i]
Description	The current value/status of the switching channel is sent to the network here; either immediately upon being changed or after a delay defined in UCPTfeedbackDelay[i]. Switch-on and switch-off delays are regarded as being complete. This output can be cyclically sent over the period specified in SCPTmaxSendTime[i]. When the DALI Controller is operated via the "All On" or "All Off" device buttons, this output is set to {0;-1} until a synchronisation with the LON network is done via the "Sync" button or a valid telegram is received.

Configuration parameters

UCPTonDelay - Switch-on delay

Type	UNVT_time_sec
Value range	0 ... 65535 s [1 s]
Default value	0 s
Description	Time between reception of an ON telegram and its execution.

UCPToffDelay - Switch-off delay

Type	UNVT_time_sec
Value range	0 ... 65535 s [1 s]
Default value	0 s
Description	Time between reception of an OFF telegram and its execution.

UCPTautoOffTime - Automatic switch-off time

Type	UNVT_time_sec
Value range	0 ... 65535 s [1 s]
Default value	0 s
Description	The output switches off once this time has expired (Stairwell switch-off). The time begins once an ON telegram is received. The value 0 deactivates this function.

UCPTrestartAutoOffTimer - Automatic switch-off time extendable

Type	UNVT_boolean
Value range	FALSE, TRUE
Default value	TRUE
Description	The automatic switch-off time can be restarted by further ON telegrams, even when it is already switched on.

Configuration parameters

UCPTbreakAutoOffTimer - Automatic switch-off time interruptible

Type	UNVT_boolean
Value range	FALSE, TRUE
Default value	FALSE
Description	The output is prematurely switched off when an OFF telegram is received, also when an automatic switch-off time is set.

UCPTlaMaxRcvTime - Maximum reception pause

Type	SNVT_time_sec
Value range	0.0 ... 6553.5 s [0.1 s]
Default value	0.0 s
Description	The maximum time that may pass without an update to nviLampValue or nviEasyControl before the lamp value is output during a reception fault. The value 0 deactivates this function.

SCPTmaxSendTime - Maximum transmission pause

Type	SNVT_time_sec
Value range	0.0 ... 6553.5 s [0.1 s]
Default value	0.0 s
Description	The maximum interval for continuous transmission of the current value.

UCPTfeedbackDelay - Feedback delay

Type	UNVT_time_msec
Value range	0 ... 65535 ms [1 ms]
Default value	300 ms
Description	Time by which the feedback value is delayed before being sent. Begins anew with every received telegram. Required to reduce the bus load when dimming. Must be greater than the time between two dim telegrams.

UCPTdefaultLampValue - Default lamp value

Type	SNVT_switch
Value range	.value: 0 ... 100 % [0.5 %] .state: -1 ... 0 [1]
Default value	0.0 0
Description	The value adopted by nviLampValue after power is restored or a reset is performed. The output value is the result of the logical linking of the default input variable values. For -1 the output retains its current setting.

Configuration parameters

`UCPTldefaultManOverrideSw[i]` – Standard override lamp value

Type	SNVT_switch	
Valid Range	.value:	0 .. 100 %
	.state:	0, 1, -1
	On:	.state = 1 and .value > 0
	Off:	.state = 0 and .value = any or .state = 1 and .value = 0
	Disabled:	.state = -1
Default Value	.value	= 0
	.state	= -1
Description	Value the input adopts when the device's power supply does return, a reset does occur, or the logical operation does generate an appropriated result. If `.state` = -1, this parameter is disabled and the output remains its current state, even if the logic operation has calculated an inverse value of this parameter.	

`UCPTafterReleaseManOverride` - Override after release

Type	UNVT_switch_cfg
Value range	.function: SW_NUL, SW_HOLD, SW_VALUE; .value: 0.0 ... 100.0 % [0.5 %]
Default value	SW_NUL 0.0
Description	The value adopted by the output after releasing via nviManOverride. SW_NUL -> last valid value of nviLampValue, SW_HOLD -> current state is retained.

`UCPTrcvFailureLampValue` - Lamp value when reception faulty

Type	SNVT_switch
Value range	.value: 0 ... 100 % [0.5 %] .state: -1 ... 0 [1]
Default value	0.0 -1
Description	Value adopted by the output when no telegram is received within the maximum reception pause period. (used for monitoring the data transfer.)

`UCPTpowerFailureLampValue` - Lamp value in case of power failure

Type	SNVT_switch
Value range	.value: 0 ... 100 % [0.5 %] .state: -1 ... 0 [1]
Default value	0.0 -1
Description	Value adopted by the output when the power fails. When .state = -1 the output retains its current setting.

`UCPTdimTime` - Total dimming time

Type	SNVT_time_sec
Value range	0.0 ... 6553.5 s [0.1 s]
Default value	4.0 s
Description	The time required to dim from 100 % to 0 %.

Configuration parameters

UCPTvalueChangeMode - Fading times

Type	UNVT_change_md
Value range	SoftOn: 0,0 ... 6553.5 s [0,1 s]; SoftOff: 0,0 ... 6553.5 s [0,1 s]; SoftChange: 0,0 ... 6553.5 s [0.1 s]
Default value	0.0 0.0 0.0
Description	Defines the cross-fade times for switch-on, switch-off, and value changes.

UCPTadaptationTable - Adaptation table

Type	UNVT_adapt_tbl
Value range	Byte[0 ... 20]: 0 ... 255 [1];
Default value	1 13 25 38 51 64 76 89 102 114 127 140 152 165 178 191 205 216 229 241 254
Description	Table used to adapt the software to suit different hardware. (do not modify!)

6.3 Constant Light Controller

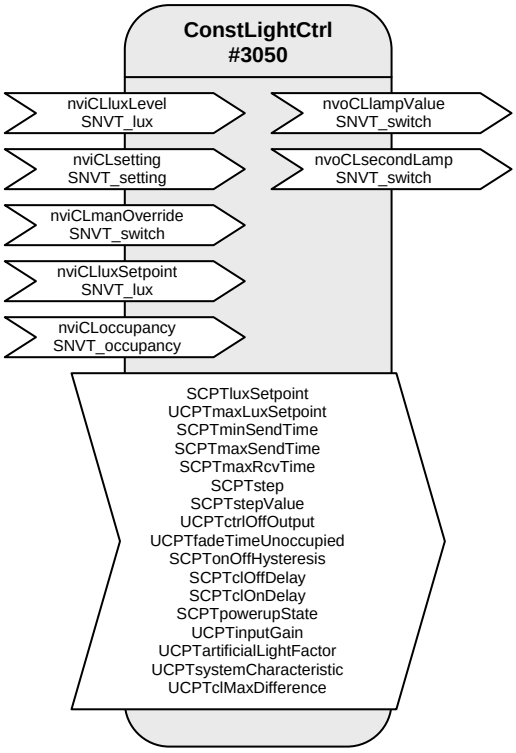


Table: Functions, parameters, and variables of the ConstLightCtrl object

Function	Network variable	Type
Ambient light level input	nviCLluxLevel	SNVT_lux
Mode selection, setpoint adjustment	nviCLsetting	SNVT_setting
Control output for lamp	nvoCLlampValue	SNVT_switch
Illumination level setpoint	nviCLluxSetpoint	SNVT_lux
Manual override	nviCLmanOverride	SNVT_switch
Reduced lamp control value	nvoCLsecondLamp	SNVT_switch
Occupancy status input	nviCLoccupancy	SNVT_occupancy

Function	Configuration parameters	Type
Desired brightness value	SCPTluxSetpoint	SNVT_lux
Maximum desired value	UCPTmaxLuxSetpoint	SNVT_lux
Minimum transmission interval	SCPTminSendTime	SNVT_time_sec
Maximum transmission pause	SCPTmaxSendTime	SNVT_time_sec
Maximum reception pause	SCPTmaxRcvTime	SNVT_time_sec
Maximum step size	SCPTstep	SNVT_lev_cont
Dimming step size	SCPTstepValue	SNVT_lev_cont
Output: Controller off	UCPTctrlOffOutput[2]	SNVT_switch_cfg
Fade time unoccupied	UCPTfadeTimeUnoccupied	SNVT_time_sec
Switching hysteresis	SCPTonOffHysteresis	SNVT_lev_cont
Light switch-off delay	SCPTclOffDelay	SNVT_time_sec
Light switch-on delay	SCPTclOnDelay	SNVT_time_sec
Controller state on restoration of power	SCPTpowerupState	SNVT_setting
Input gain	UCPTinputGain	SNVT_muldiv
Artificial light factor	UCPTartificialLightFactor	SNVT_muldiv
Closed-loop control characteristic line	UCPTsystemCharacteristic[11]	SNVT_lev_cont
Maximum difference	UCPTclMaxDifference	SNVT_lev_cont

Daylight-dependent regulation/control

With a Constant Light Controller it is possible to regulate or control up to two lighting groups on a daylight-dependent basis.
To do this, the measurement value of a LON brightness sensor at `nviCLluxLevel[i]` is internally converted to a brightness value with regard to a reference surface (e.g, a desktop) and used as a current value for the regulation algorithm.
Both indoor lighting sensors and shadowed outdoor lighting sensors (e.g. an indoor lighting sensor pointed at the window) can be used for control.

Operation

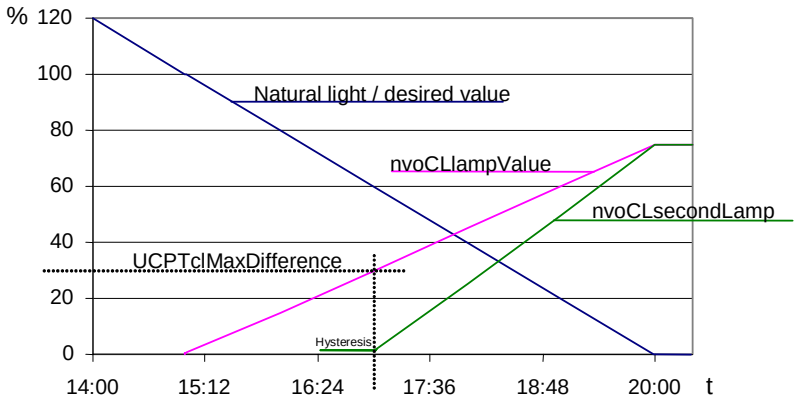
`nviCLsetting[i]` can be used to set the controller, and the lighting, on and off (`SET_ON/SET_OFF`), dimmed (`SET_UP/SET_DOWN`) or overwritten (`SET_STATE`). After dimming, the current value is stored as the new desired value and is then limited to a maximum value of `UCPTmaxLuxSetpoint`. After a restart, or a SET_ON value via `nviCLsetting[i]` the desired regulation value defined in `SCPTluxSetpoint[i]` is used.

Prioritised control

The input `nviCLmanOverride[i]` has the highest priority. A value at this input is directly forwarded to the first lamp output and, with the defined difference, to the second output. The input can thus be used as an additional input for a third lighting band.

Multiple lighting strips

The inner lighting band is controlled via `nvoCLlampValue[i]`, the window side via `nvoCLsecondLamp[i]`. The maximum difference that occurs when the light band at the window is still off can be set `UCPTclMaxDifference`. The second light band is switched on and off by the regulator as required.



Additional light bands can be controlled with additional Constant Light Controllers by binding the `nvoCLlampValue[i]` of the active regulator to the `nviCLmanOverride[i]` of these objects.

The regulator

The regulator is a non-linear state regulator (fuzzy based), that can be used for both regulation (based on room brightness measurements) and control (by using an outdoor light sensor or measurements focused on a window).

On activation of the regulator, the object always operates as a controller to directly switch on the lighting with brightness near to the desired value. Cold light sources can result in an initially lower starting brightness in the room. This is intentionally accepted to take account of the subjective perception of the user. This behaviour avoids the user having the (subjective) impression that it is too dark in a situation where dimming is normally required (when the warm-up phase is finished).

After switching on and the desired value has been changed, the regulator maintains the set value for 30 s to allow the lighting to reach operating temperature or the light sensor to transmit the new brightness value, before beginning regulation. If switch-off and switch-on again occurs within this 30 s, then the lamps are switched on with the same brightness.

The regulation speed is dynamically adjusted depending on the regulation deviation. This can be changed as required via `SCPTstep[i]`, which defines the maximum step size within 1 s for `nvoCLlampValue[i]`. The step size for `nvoCLsecondLamp[i]` is derived from this and may be somewhat larger.

If the calculated brightness value at the reference point lies above the value defined in `SCPTonOffHysteresis[i]` for the time specified in `SCPTclOffDelay[i]` then an automatic switch-off occurs. This also applies to automatic switch-on and `SCPTclOnDelay[i]`. The automatic switching can be deactivated by setting the respective delay time to 0.

Notes on observing the network variables

The regulator does not regulate to `nviCLluxLevel[i] = SCPTluxSetpoint[i]` but rather to the internally calculated brightness of the reference surface.

Commissioning as a regulator

1. All required bindings must first be established. The room should be furnished to avoid any possible problems with furnishing-dependent reflections.
2. Calibrate the light sensor with a lux meter so that the brightness of the reference surface (e.g. desktop) is displayed under **daylight** conditions. The best result is achieved when this is done at a brightness close to the desired value.
3. Once `nvoCLsecondLamp[i]` is bound, the maximum difference (`UCPTclMaxDifference[i]`) between the two control values can be adjusted. To do this, adjust `UCPTclMaxDifference[i]` (preferably in cloudy weather) so that after SET_ON at the `nviCLsetting[i]` input the brightness difference measured with a lux meter below the two lighting groups is as small as possible.

In most cases the procedure described above is sufficient for commissioning the regulator, and calibration of the regulator (steps 3 + 4) is not required, since the factory settings usually provide very good results. If further optimisation of the regulation is nevertheless required, then proceed as follows:

4. Directed artificial light is often not so strongly measured by a sensor on the ceiling as highly diffused natural light. This sensitivity difference can be compensated for using an artificial light factor (`UCPTartificialLightFactor`). To do this, the brightness change on the reference surface caused by artificial light and the associated change measured by the light sensor on the ceiling must be determined. Proceed as follows:
   Remove the daylight source (if possible) and use `nviCLsetting[i].function` = SET_STATE and `.setting` = 100 % to switch-on all regulated light bands to the maximum value. After a warm-up time for the lighting (brightness remains constant), measure the brightness on the reference surface with a lux meter and note the output value of the LON light sensor. Then use `nviCLsetting[i].function` = SET_STATE and `.setting` = 0 to switch off the lights and measure both values again. Enter the change (difference) of the brightness on the reference surface into the `.multiplier` field, and the change in the brightness at the light sensor into the `.divisor` field of `UCPTartificialLightFactor[i]`.
   `multiplier` = Δ–Reference surface (lux meter) `divisor` = Δ–Ceiling (LON light sensor)

5. This completes the configuration process.

In weather situations with different levels of daylight diffusion, the actual value of the reference surface may differ from the internally calculated value. If it is later determined that this causes the room to tend to be too dark, then you can increase `UCPTartificialLightFactor.divisor` somewhat (and vice versa).

Commissioning as a controller

1. All required bindings must first be established. The room should be furnished to avoid any possible problems with furnishing-dependent reflections.
2. To determine the artificial light factor (`UCPTartificialLightFactor`), proceed as follows:
   Remove the daylight source (if possible) and use `nviCLsetting[i].function` = SET_STATE and `.setting` = 100 % to switch-on all regulated light bands to the maximum value. After a warm-up time for the lighting (brightness remains constant), measure the brightness on the reference surface with a lux meter.

Then use `nviCLsetting[i].function` = SET_STATE and `.setting` = 0 to switch off the lights and measure the value again. The measured change (difference) is then entered into the `.multiplier` field, the `.divisor` is set to 1.
`multiplier` = Δ–Reference surface
`divisor` = 1

3. Enter this current brightness value on the reference surface with the lighting switched off (`nviCLsetting[i].function` = SET_STATE and `.setting` = 0) into the input gain parameter (`UCPTinputGain.multiplier`). The associated current brightness value of the LON light sensor is entered into `.divisor`. The best result is achieved when this is done at a brightness close to the desired value, e.g. in cloudy weather or at dusk.
4. Once `nvoCLsecondLamp[i]` is bound, the maximum difference (`UCPTclMaxDifference[i]`) between the two control values can be adjusted. To do this, adjust `UCPTclMaxDifference[i]` (preferably in cloudy weather) so that after SET_ON at the `nviCLsetting[i]` input the brightness difference measured with a lux meter below the two lighting groups is as small as possible.
5. For optimisation of the closed-loop control characteristic line, the behaviour of the light sensor and lamps can be adjusted in 10 % steps. It should be noted that a continuously increasing characteristic line must be present, otherwise the behaviour can fluctuate significantly at different times of day and under different weather conditions, depending on the sensor type and installation location.
   For approximate adjustment without accounting for sensor properties, one can use `nviCLsetting[i].function` = SET_STATE to dim the bound lamps in 10 % steps (take account of warm-up times) and the determined difference to 0 % can then be entered into the appropriate fields of `UCPTsystemCharacteristic[i]`. When doing this, i = 0 for 0.5 %; i = 1 for 10 %; i = 2 for 20 % etc. Note that a constantly falling characteristic line must result.
6. This completes the configuration process.

General notes on fluorescent lamps

- The energy consumption of fluorescent lamps dimmed to the minimum value is approx. 13 %
- The lifetime of fluorescent lamps is heavily dependent on the switching frequency. For this reason, the lamps should only be switched off when the pause is longer than 15 minutes.
- Modern fluorescent lamps still have 90 % of their light flux after 10,000 operating hours. In the case of simpler models, the maximum light flux can sink to 75 %.
- New lamps must be burned-in for 100 hours at 100 % brightness before commissioning the object. This provides basic stabilisation of the lamps.

(Source: http://www.osram.de/service_corner/faq/allgemein/leuchtstoff.html)

Input variables

nviCLluxLevel - Ambient light level input

Type	SNVT_lux
Value range	0 ... 65535 lux [1 lux]
Default value	0 lux
Description	Input for the current brightness value.

nviCLsetting - Mode selection, setpoint adjustment

Type	SNVT_setting
Value range	.function: SET_OFF, SET_ON, SET_UP, SET_DOWN .setting: 0 ... 100 %
Default value	UCPTpowerupState[i]
Description	Activate (SET_ON) or deactivate (SET_OFF) the daylight-dependent regulation. On deactivation nvoCLlampValue[i] and nvoCLsecondLamp[i] are set to {0, 0}, on activation both outputs are switched on with a value calculated by the regulator that is close the the desired value . SET_UP or SET_DOWN allow manual dimming of nvoCLlampValue[i]. Time delays for this dimming process are defined by the parameters SCPTstepValue[i] and SCPTminSendTime[i]. Regulation is deactivated during this time. Once the manual control is finished, the current brightness becomes the temporary desired value and regulation is reactivated. SET_STATE sets both outputs to the value defined in .setting and regulation is deactivated. A new SET_ON reactivates the desired value stored in SCPTluxSetpoint[i].

nviCLmanOverride - Manual override

Type	SNVT_switch
Value range	.value: 0 ... 100 % [0.5 %] .state: -1 ... 0 [1]
Default value	0.0 -1
Description	For. value <= 100, .state = 0/1 the regulation is deactivated. The received value is directly forwarded to nvoCLlampValue[i], and nvoCLsecondLamp[i] is set under consideration of the offset defined in UCPTclMaxDifference[i]. If priority control is removed once more and regulation reactivated, then .state must be set to -1.

nviCLluxSetpoint - Illumination level setpoint

Type	SNVT_lux
Range	0 .. 65,535 lux
Default	**SCPTluxSetpoint[i]**
Description	Determines the actual illumination-level setpoint of the controller. A defined value received at this input disables the setpoint of SCPTluxSetpoint[i] and replaces it. nviCLluxSetpoint[i] = 0 enables the setpoint value in SCPTluxSetpoint[i] again. After reset SCPTluxSetpoint[i] is valid.

Input variables

nviCLoccupancy - Occupancy status input

Type	SNVT_occupancy
Range	OC_OCCUPIED, OC_UNOCCUPIED, OC_STANDBY, OC_NUL
Default	OC_NUL
Description	This input is only valid at nviCLsetting = SET_NUL. With OC_OCCUPIED the controller will be activated. The outputs will be set as far as the current brightness-value allows this. At OC_UNOCCUPIED, OC_STANDBY, OC_BYPASS , OC_NUL the light will be dimmed to zero by UCPTfadetimeUnoccupied.

Output variables

nvoCLlampValue - Control output for lamp

Type	SNVT_switch
Value range	.value: 0 ... 100 % [0.5 %] .state: -1 ... 0 [1]
Default value	0.0 -1
Description	Provides the value for a dimming or switching actuator (lamp actuator) that was calculated by the regulation process or manually set. The output is suitable for binding another lighting regulator for additional lighting bands (up to 2 lighting groups).

nvoCLsecondLamp - Reduced lamp control value

Type	SNVT_switch
Value range	.value: 0 ... 100 % [0.5 %] .state: -1 ... 0 [1]
Default value	0.0 -1
Description	Second, slaved output of the controller for controlling another lighting band at reduced intensity (usually window side). The deviation from the output at nvoCLlampValue[i] is defined by the value set in UCPTmaxDifference[i] and is dynamic over the entire range (high deviation with a high proportion of outdoor light, low deviation with a high proportion of artificial light).

Configuration parameters

SCPTluxSetpoint - Desired brightness value

Type	SNVT_lux
Value range	0 ... 65535 lux [1 lux]
Default value	500 lux
Description	The desired brightness value for the controller.

Configuration parameters

UCPTmaxLuxSetpoint - Maximum desired value

Type	SNVT_lux
Value range	0 ... 65535 lux [1 lux]
Default value	0 lux
Description	Maximum brightness value by which the desired value can be shifted (0 = unlimited).

SCPTminSendTime - Minimum transmission interval

Type	SNVT_time_sec
Value range	0.0 ... 6553.5 s [0.1 s]
Default value	0.2 s
Description	The minimum interval between two consecutive telegrams. Used to limit the bus loading, among other purposes.

SCPTmaxSendTime - Maximum transmission pause

Type	SNVT_time_sec
Value range	0.0 ... 6553.5 s [0.1 s]
Default value	300.0 s
Description	The maximum interval for continuous transmission of the current value.

SCPTmaxRcvTime - Maximum reception pause

Type	SNVT_time_sec
Value range	0.0 ... 6553.5 s [0.1 s]
Default value	0.0 s
Description	If no update to the lux value in nviCLluxLevel[i] is received within the time specified here, then a fault in the LON network is assumed and the regulation assumes a sensor value of 0. The value 0 deactivates this function.

SCPTstep - Maximum step size

Type	SNVT_lev_cont
Value range	0.0 ... 100,0 % [0.5 %]
Default value	3.0 %
Description	The maximum step size used by the regulator to reach the desired value.

SCPTstepValue - Dimming step size

Type	SNVT_lev_cont
Value range	0.0 ... 100.0 % [0.5 %]
Default value	5.0 %
Description	Step size for consecutive dim commands.

Configuration parameters

UCPTctrlOffOutput - Output: Controller off.

Type	UNVT_switch_cfg
Value range	.function: SW_INVALID; SW_HOLD; SW_VALUE .value: 0.0 ... 100.0 % [0.5 %]
Default value	SW_HOLD 0.0 %
Description	This value is output when the regulator is switched off or the state changes to vacant.

UCPTfadeTimeUnoccupied - Fade time unoccupied

Type	SNVT_time_sec
Range	0.0 ... 6553.5 seconds [0.1 seconds]
Default	0.0 seconds
Description	The desired time to fade to zero, when unoccupied.

SCPTonOffHysteresis - Switching hysteresis

Type	SNVT_lev_cont
Value range	0,0 ... 100.0 % [0.5 %]
Default value	5.0 %
Description	Relative deviation from the desired value causing the regulator output to be automatically switched on or off. The value 0 deactivates the automatic switching. The lamp output is switched off when the lighting level lies above the desired value, plus this hysteresis value, for the time specified in SCPTclOffDelay[i]. The lamp output automatically switches on when the brightness value lies below the desired value, minus the hysteresis value, for the time specified in SCPTclOnDelay[i].

SCPTclOffDelay - Light switch-off delay

Type	SNVT_time_sec
Value range	0.0 ... 6553.5 s [0.1 s]
Default value	300.0 s
Description	Time after which the regulator output is switched off when adequate brightness exists. The controller remains active.

SCPTclOnDelay - Light switch-on delay

Type	SNVT_time_sec
Value range	0.0 ... 6553.5 s [0.1 s]
Default value	0.1 s
Description	Time after which the regulator output is switched on when inadequate brightness exists.

Configuration parameters

SCPTpowerupState - Controller state on restoration of power

Type	SNVT_setting
Value range	.function: SET_NUL, SET_OFF, SET_ON, SET_DOWN, SET_UP, SET_STOP, SET_STATE; .setting: 0.0 ... 100.0 % [0.5]
Default value	SET_ON 0.0 0.00
Description	State of the light regulator object after restoration of power or a reset.

UCPTinputGain - Input gain

Type	SNVT_muldiv
Value range	multiplier: 0 ... 65535 [1]; divisor: 1 ... 65535 [1]
Default value	1 1
Description	Level of input amplification for adjusting the sensor values with regard to the measured values on the reference surface. Required when one sensor is bound to multiple controllers.

UCPTartificialLightFactor - Artificial light factor

Type	SNVT_muldiv
Value range	multiplier: 0 ... 65535 [1]; divisor: 1 ... 65535 [1]
Default value	700 350
Description	Factor used to calculate the artificial light component of the measured brightness value. Settings: see above.

UCPTsystemCharacteristic[11] - Closed-loop control characteristic line

Type	SNVT_lev_cont
Value range	0.0 ... 100.0 % [0.5 %]
Default value	1.0 1.5 2.5 4.0 6.5 10.0 16.0 25.0 40.0 64.0 100.0
Description	Defines the behaviour of the closed-loop control system. Settings: see above.

UCPTclMaxDifference - Maximum difference

Type	SNVT_lev_cont
Value range	0,0 ... 100.0 % [0.5 %]
Default value	30.0 %
Description	Maximum difference between the two setting values. nvoCLsecondLamp will only be switched on when nvoCLlampValue has reached this value.

6.4 DaliScene

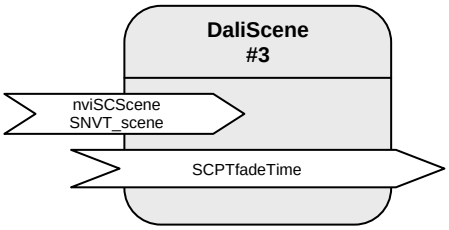


Table: Functions, parameters, and variables of the DaliScene object

Function	Network variable	Type
Scene trigger input	nviSCScene	SNVT_scene
Function	**Configuration parameters**	**Type**
Scene cross-fade time	SCPTfadeTime	SNVT_time_sec

Scenes

The DALI allows up to 16 light scenes to be stored. The stored scene configurations can be directly called up into the DALI devices by their number using `nviSCScene[i].function` = SC_RECALL. Configuration of a DALI lighting scene is initiated via `nviSCScene[i].function` = SC_LEARN. The current lighting values at the DALI devices are then stored in the scene storage. Scenes can be deleted via `nviSCScene[i].function` = SC_RESET.
The cross-fade behaviour when changing scenes can be set using the configuration variables `SCPTfadeTime[i]`. This value is stored in the DALI devices and also affects the direct control of the lighting groups via the "Lamp Actuator" object.

Input variables

`nviSCScene` - Scene trigger input

Type	SNVT_scene
Value range	.function: SC_NUL, SC_RECALL, SC_LEARN, SC_RESET .scene_number: 1 ... 16, 255
Default value	SC_NUL 255
Description	Scene trigger input

Configuration parameters

`SCPTfadeTime` - Scene cross-fade time

Type	SNVT_time_sec
Value range	0.0 ... 6553.5 s [0.1 s]
Default value	0.0 s
Description	The time over which a new scene value is cross-faded. **The value set here is directly stored in the DALI devices and is thus also valid when new brightness values are directly called up in the Lamp Actuator object!**

6.5 GlobalControl

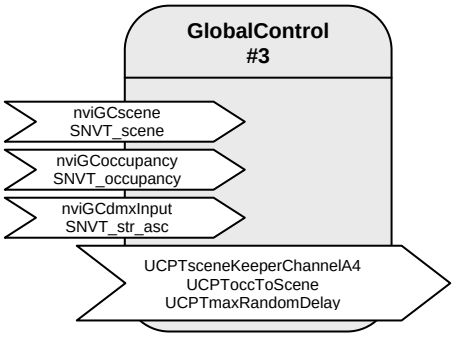


Table: Functions, parameters, and variables of the GlobalControl object

Function	Network variable	Type
Global scene input	nviGCscene	SNVT_scene
Global occupancy state	nviGCoccupancy	SNVT_occupancy
Multiplex Input	nviGCdmxInput	SNVT_str_asc
Function	**Configuration parameters**	**Type**
Scene storage for group switching	UCPTsceneKeeperChannelA4	UNVT_skca_4
Occupancy to scene	UCPToccToScene	UNVT_os_scene
Maximum random delay	UCPTmaxRandomDelay	SNVT_time_sec

Central control

The "Global Control" object allows all DALI groups to be switched by a central binding. The "Global Control" object directly affects the actuator channels. This allows implementation of group switching or lighting effects.

At the `nviGCscene` input, freely definable scenes can be called up that define a separate brightness value for each actuator channel. Priorities of 0 (only adopted in absence mode), 1 (normal) and 2 (override) can be selected.

For temporal correction of central switching commands, the activation of the requested scenes can be parameterised with a configurable random period (`UCPTmaxRandomDelay`).

All actuator channels can be combined into an effects control system via `nviGCdmxInput`. However, the values are only adopted when the nviLAlampValue of the relevant object is invalid (-1).

Input variables

nviGCscene - Global scene input

Type	SNVT_scene
Value range	.function: SC_RECALL .scene_number: 1 ... 10
Default value	.function = SC_NUL .scene_number = 0
Description	Input for central activation/deactivation of functions (ON/OFF) of the individual actuator channels. UCPTmaxRandomDelay can be used to define a device-specific random delay to avoid load peaks in the central control system.

nviGCoccupancy - Global occupancy state

Type	SNVT_occupancy
Range	OC_OCCUPIED, OC_UNOCCUPIED, OC_BYPASS, OC_STANDBY, OC_NUL
Default	OC_NUL
Description	Input for a central presence/absence-control. Here incoming values will be related to an allocation table UCPToccToScene transferred into a scene number. An incoming telegram will thereby activate the dedicated presence-related scene. By UCPTmaxRandomDelay a device-specific random delay can be configured, to avoid load-peaks at central-control-switching.

nviGCdmxInput - Multiplex Input

Type	SNVT_str_asc
Value range	0 ... 200
Default value	0
Description	This input allows transfer of the dimming values for all channels at the same time. The element .ascii[0] is the dimming value for nvoLClampValue[0], the element ascii[1] is the dimming value for nvoLCsecondLamp[0] and so on. The brightness values are only adopted when the affected channel is not overridden and is in the absent state. The values in .ascii[i] are interpreted as follows: .ascii[i] = 0 → from .ascii[i] = 1 ... 200 → Dimming value 0.5 ... 100 % in 0.5 % steps .ascii[i] > 200 → Current brightness is not changed.

Configuration parameters

UCPTsceneKeeperChannelA4 - Scene storage for group switching

Type	UNVT_skca_4		
Value range	.scene:	0 ... 255 [1]	
	.priority:	0, 1	
	.chanel[4] :	0 ... 100 % [0.5 %]	Dim value
		100.5 % ... 127 % [0.5]	Brightness is not changed
		127.5 %	Override release
	.fadetime:	0 ... 6.553 s [0.1 s]	without function
Default value	.scene	= i +1	
	.priority	= 0	
	.chanel[4]	= 0	
	.fadetime	= 0	

Description Scenes for common switching of the actuator channels: When setting nviGCscene = .scene, the actuator channels are switched according to the entries in .channel[i]. The priority of the scene is defined in the .priority field.
0: low priority, only adopted in the absent state.
1: normal priority
2: high priority (override)

UCPToccToScene - Occupancy to scene

Type UNVT_os_scene

Range .oc_occupied: 0 ... 255 [1]; .oc_unoccupied: 0 ... 255 [1]; .oc_standby: 0 ... 255 [1]; .oc_bypass: 0 ... 255 [1]; .oc_nul: 0 ... 255 [1]

Default 1 2 3 4 5

Description Assigns scene numbers depending on the occupancy states.

UCPTmaxRandomDelay - Maximum random delay

Type SNVT_time_sec

Value range 0.0 ... 6553.5 s [0.1 s]

Default value 0.0 s

Description Maximum time between reception of a global telegram and its execution. (avoids electronic switching spikes)