e.control
lumina B8 –Binary Input 8DI
SC111008EC_13.*

spega

Software description

This document describes the behaviour and parameterisation of the software application listed below. The application is split into logical objects according to LONMARK™-Interoperability Guidelines. The objects' behaviour is described separately in this document.

spega offers object oriented LNS plug-ins for all software objects to ensure easy configuration for the system integrator. Refer to the plug-in help system for further information.

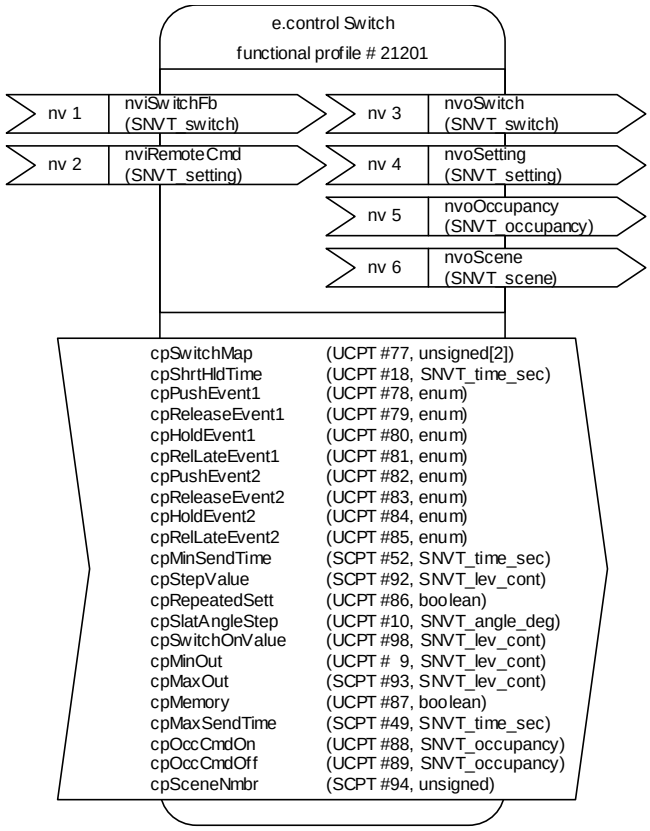
The application complies with LONMARK-Interoperability-Guidelines. With LNS based system integration tools the use of e.control resource files is recommended.

*IMPORTANT: This application is applicable for spega device with hardware release 2 only. This is indicated by „HW 2" on the Neuron-ID label. For hardware release 1 please use application files SC111008EC_03.**

Application files

Files	SC111008EC_13.APB SC111008EC_13.NXE SC111008EC_13.XIF SC111008EC_13.XFB	Application files Interface files
Resource files Plug-Ins	e.control resource files v.1.02+ available	

Overview of implemented software objects

Quantity	Object	Interface
8	#21201 Switch	

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e.control
Switch
Profile # 21201 (corresponds to LONMARK # 3200)

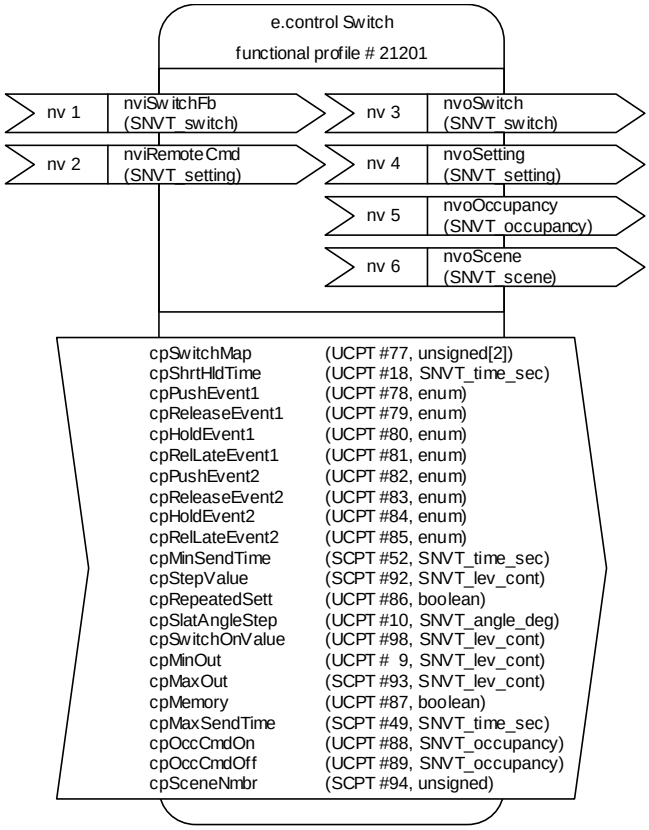
Version/Status

3.0	05.05.2003

Description

Using the switch object of the e.control system, it is possible, with conventional installation switches, to control or dim lights and other consumers as well as to control blinds and retrieve light scenes. Absence or presence reports can also be made to other system components (such as thermostats for example).

Network interface



Network variables

Input variables

`nviSwitchFb` — Checkback input for switching/dimming actuators where several switches are being used for one light circuit)

Type: SNVT_switch

Range of values: SNVT_switch

Presetting: (0.0, 0)

`nviRemoteCmd` — Input variable for forwarding central management commands to connected actuators

Type: SNVT_setting

Range of values: SNVT_setting

Presetting: (SET_OFF, 0.0, 0.00)

Output variables

`nvoSwitch` — Output of switching values for controlling the light (switching/dimming)

Type: SNVT_switch

Range of values: SNVT_switch

Presetting: (0.0, 0)

Transmission: Once in the event of a switching edge as well as in cycles (*cpMinSendTime)* on dimming commands and in cycles after the time set in *cpMaxSendTime* (heartbeat)

`nvoSetting` — Control output for sun blinds or switching functions

Type: SNVT_setting

Range of values: SNVT_setting (*function)* with the relevant meanings as follows*:

0	SET_OFF	Device off
1	SET_ON	Device on
2	SET_DOWN	Decrement value
3	SET_UP	Increment value
4	SET_STOP	Stop action

Presetting: (SET_OFF, 0, 0)

Transmission: Once in the event of alterations, in cycles (*cpMinSendTime*) during dimming procedures if *cpRepeatedSett* set

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`nvoOccupancy` Output for reporting the room occupancy status, e.g. for air conditioning functions

Type: SNVT_occupancy

Range of values: SNVT_occupancy (s. *cpOccCmdOn* / *cpOccCmdOff*)

Presetting: *cpOccCmdOff*

Transmission: Once in the event of a switching edge as well as in cycles after the cpMaxSendTime (heartbeat)

`nvoScene` Scene output for recalling or storing allocated scenes

Type: SNVT_scene

Range of values: SNVT_scene (*function*), however with the following functions only:

0 SC_RECALL Recall scene
1 SC_LEARN Store scene
Scene number off *cpSceneNmbr*

Presetting: (SC_RECALL, 0)

Transmission: Once on pushing the button

Configuration parameters

`cpSwitchMap` Assignment of the pushbutton inputs to the object. Depending on functionality, one (switch1) or two switches (switch1 and switch2) can be allocated.

Type: typedef struct {
unsigned switch1;
unsigned switch2 } (UCPT #77)

Range of values:
0 No input assigned
n=1...x Input assigned

Presetting: {0 0] No inputs assigned

`cpShrtHldTime` Time threshold between the short and long hold function of the button

Type: SNVT_time_sec (UCPT #18)

Range of values: 0.1 ... 30.0 s

Presetting: 0.5 s (5)

`cpPushEvent1` Event on pushing the first button

Type: Enumeration (UCPT # 78)

Range of values:

0	EV_OFF	Switch off
1	EV_ON	Switch on
2	EV_DIM_DOWN	Dim down
3	EV_DIM_UP	Dim up
4	EV_STOP	Stop command
5	EV_SB_DOWN	Run down
6	EV_SB_UP	Run up
7	EV_SLAT_DWN	Slat down
8	EV_SLAT_UP	Slat up
9	EV_TOGGLE	Change over
10	EV_DIM	Dim up/down
11	EV_SB_TOGGLE	Run up/down
12	EV_SCENE_RCL	Recall scene
13	EV_SCENE_LRN	Learn scene
14	EV_NO_MSG	No event
-1	EV_NUL	Send invalid

Presetting: 14 EV_NO_MSG (no event)

`cpReleaseEvent1` Event on releasing the first button before expiry of the short hold time

Type: Enumeration (UCPT # 79)

Range of values: See cpPushEvent1

Presetting: 9 EV_TOGGLE (Switch on/off)

`cpHoldEvent1` Event on reaching the short hold time with the first button depressed

Type: Enumeration (UCPT # 80)

Range of values: See cpPushEvent1

Presetting: 10EV_TOGGLE (Dim up/down)

`cpRelLateEvent1` Event on releasing the first button after expiry of the short hold time

Type: Enumeration (UCPT # 81)

Range of values: See cpPushEvent1

Presetting: 4 EV_STOP (Send stop command)

`cpPushEvent2` Event on pushing the second button

Type: Enumeration (UCPT # 82)

Range of values: See *cpPushEvent1*

Presetting: 14 EV_NO_MSG (No event)

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`cpReleaseEvent2` Event on releasing the second button before expiry of the short hold time

Type: Enumeration (UCPT # 83)

Range of values: See *cpReleaseEvent1*

Presetting: 14EV_NO_MSG (no event)

`cpHoldEvent2` Event on reaching the short hold time with the second pushbutton depressed

Type: Enumeration (UCPT # 84)

Range of values: See *cpHoldEvent1*

Presetting: 14EV_NO_MSG (no event)

`cpRelLateEvent2` Event on releasing the second pushbutton after expiry of the short hold time

Type: Enumeration (UCPT # 85)

Range of values: See *cpRelLateEvent1*

Presetting: 14EV_NO_MSG (no event)

`cpMinSendTime` Indicates the time between two dimming telegrams

Type: SNVT_time_sec (SCPT #52)

Range of values: 0 ... 6553.5 s

Presetting: 0.1 s (1)

`cpStepValue` Indicates the step value between two dimming telegrams

Type: SNVT_lev_cont (SCPT #92)

Range of values: 0.5 ... 100%

Presetting: 4 (2 %)

`cpRepeatedSett` Indicates whether the control output nvoSetting is to be sent in cycles in the event of dimming commands

Type: Boolean (UCPT #86)

Range of values: 0 FALSE no sending in cycles
1 TRUE sending in cycles

Presetting: TRUE (1)

`cpSlatAngleStep` Indicates the step angle for adjusting the slats in the event of _SLAT_xxx

Type: SNVT_angle_deg (UCPT #10)

Range of values: - 90° ...+ 90°

Presetting: 10° (500)

`cpSwitchOnValue` Indicates the switch-on value for switching events

Type: SNVT_lev_cont (UCPT #98)

Range of values: 0 ... 100%

Presetting: 100 % (200)

`cpMinOut` Indicates the lower threshold for dimming procedures

Type: SNVT_lev_cont (UCPT # 9)

Range of values: 0 ... 100%

Presetting: 0 % (0)

`cpMaxOut` Indicates the upper threshold for dimming and switching procedures

Type: SNVT_lev_cont (SCPT #93)

Range of values: 0 ... 100%

Presetting: 100 % (200)

`cpMemory` Indicates whether the last brightness value should be recalled in the event of starting commands (Memory)

Type: Boolean (UCPT #87)

Range of values: 0 FALSE send *cpSwitchOnV*
1 TRUE send memory value

Presetting: TRUE (1)

`cpMaxSendTime` Heartbeat time in the event of activated *nvoSwitch* and *nvoOccupancy* output network variables

Type: SNVT_time_sec (SCPT #49)

Range of values: 0 No heartbeat
0.5 ... 6535.5 s Repeat time in sec.

Presetting: 0 (no heartbeat)

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`cpOccCmdOn` Indicates the occupancy command, sent parallel to a starting event via *nvoOccupancy*

Type: SNVT_occupancy (UCPT #88)

Range of values: See SNVT_occupancy

Presetting: OC_OCCUPIED (0) - occupied

`cpOccCmdOff` Indicates the occupancy command sent via *nvoOccupancy,* parallel to a switching-off event

Type: SNVT_occupancy (UCPT #89)

Range of values: See SNVT_occupancy

Presetting: OC_UNOCCUPIED (1) - unoccupied

`CpSceneNmbr` Scene number

Type: unsigned short (SCPT #94)

Range of values: 0 Scene invalid
1...255 Scene number

Presetting: 0

Functional description

The switch object sends – as a function of the parameter setting – switching or control commands for starting up light or blind actuators as well as for controlling scenes or manual occupancy reporting.

Conventional switches, pushbuttons or other floating contacts can be connected to the pushbutton interface. It is possible to select the assignment of the pushbutton inputs to the relevant software objects.

Assignment of the inputs to the switch object

The switch object supports operation with one or two pushbuttons. Assignment takes place by specifying the relevant input port in *cpSwitchMap*. If no hardware input has been assigned, "0" should be selected.

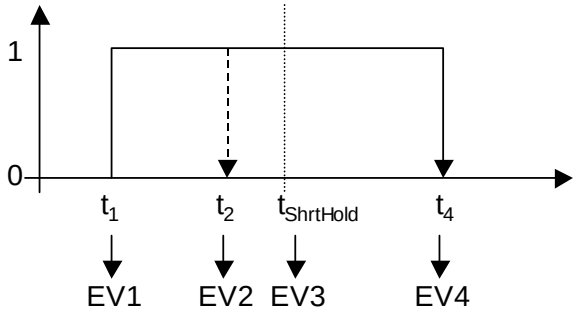
E.g.: {3 4} assigns inputs 3 (1st button) and 4 (2nd button) to the object, i.e. two-button station function

{2 0} assigns the object input 2 as the first button, a second input is not assigned

Assignment of actions to pushbutton events

1. Pushbutton events

The button-pushing process generates up to four different events, depending on the profile.



EV1 Pushing the pushbutton
EV2 Releasing the pushbutton before expiry of the short hold time
EV3 Expiry of the short hold time
EV4 Releasing the pushbutton after expiry of the short hold time

By assigning certain actions which are performed by the object during each respective event, the functionality of the object can be freely configured.

Assignment takes place on the basis of the following parameters:

Parameter	**Description of the event**
cpPushEvent1	Pushing the first button
cpReleaseEvent1	Releasing the first button before expiry of the short hold time
cpHoldEvent1	Reaching the short hold time with the first button depressed
cpRelLateEvent1	Releasing the first button after expiry of the short hold time
Parameter	**Description of the event**
cpPushEvent2	Pushing the second button
cpReleaseEvent2	Releasing the second button before expiry of the short hold time
cpHoldEvent2	Reaching the short hold time with the second button depressed
cpRelLateEvent2	Releasing the second button after expiry of the short hold time

2. Selection of the short hold time

By specifying the short hold time $t_{ShrtHold}$ in the parameter *cpShrtHldTime*, the period of time, during which duration the action of event EV3 (*cpHoldEvent*) is executed, is selected. If this short hold time is eliminated ("0"), events EV2 and EV3 (*cpReleaseEvent*, *cpHoldTime*) are omitted. In this case, the object only processes edge change via events EV1 (*cpPushEvent*) and EV4 (*cpRelLateEvent*).

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3. Selection of the action to be executed

The following actions, which are executed if the previously mentioned events occur, are available to the object:

Action	**Function**
EV_OFF “Switch off “	The object sends a switch-off command as well as the assigned occupancy status: *nvoSwitch* = (0, 0) *nvoSetting* = (SET_OFF, 0, 0) *nvoOccupancy* = *cpOccCmdOff*
EV_ON “Switch on “	The object sends a switch-on command as well as the assigned occupancy status: *nvoSwitch* = (X*, 1) *nvoSetting* = (SET_ON, X*, 0) *nvoOccupancy* = *cpOccCmdOn* * The switch-on value X is determined as follows: cpMemory: TRUE FALSE Switch-on: Memory cpSwitchOnV.
EV_DIM_DOWN “Dim down “	The object sends a dim value decremented on the basis of the *cpStepValue* in cycles (*cpMinSendTime*). The dimming process is limited by *cpMinOut* (“0%“ results in a switch-off command in the event of the limit being reached. The transmission response of *nvoSetting* can be parameterised. *nvoSwitch* = (Value-cpStepValue, 1) *nvoSetting* = (SET_DOWN, cpStepValue, 0)* (or) = (SET_DOWN, 0, 0)** * in cycles, if *cpRepeatedSett* TRUE ** once, if *cpRepeatedSett* FALSE
EV_DIM_UP “Dim up “	The object sends a dim value incremented by the *cpStepValue* in cycles (*cpMinSendTime*). The dimming procedure is limited by *cpMaxOut*. The transmission response of *nvoSetting* can be parameterised. *nvoSwitch* = (Value+cpStepValue, 1) *nvoSetting* = (SET_UP, cpStepValue, 0)* (or) = (SET_UP, 0, 0)** * in cycles, if *cpRepeatedSett* TRUE ** once, if *cpRepeatedSett* FALSE
EV_STOP “Stop“	The object sends a stop command *nvoSetting* = (SET_STOP, 0, 0)
EV_SB_DOWN “Run down“	The object sends a run-down command for sunblind systems. *nvoSetting* = (SET_DOWN, 100%, 0)
EV_SB_UP “Run up “	The object sends a run-up command for sunblind systems. *nvoSetting* = (SET_UP, 100%, 0)
EV_SLAT_DOWN “Slat down “	The object sends a slat-down command for adjusting sunblind systems. *nvoSetting* = (SET_DOWN, 0%, *cpSlatAngleStep*)
EV_SLAT_UP “Slat up “	The object sends a slat turning command for adjusting sunblind systems. *nvoSetting* = (SET_UP, 0%, *cpSlatAngleStep*)
EV_TOGGLE “Change over “	The object alternately sends a switch-off or switch-on command and the assigned occupancy status: (See EV_OFF / EV_ON)
EV_DIM “Dim up/down“	The object alternately sends a dim up/dim down command: (s. EV_DIM_DOWN / EV_DIM_UP)
EV_SB_TOGGLE “Run up/down“	The object alternately sends a run-up/run-down command: (s. EV_SB_DOWN / EV_SB_UP)
EV_SCENE_RCL ”Recall scene”	The object sends a command to recall a scene. In addition, a switch-on telegram is sent to *nvoSwitch*. *nvoSwitch* = (100%, 1) *nvoScene* = (SC_RECALL, *cpSceneNmbr*)
EV_SCENE_LRN “Learn scene “	The object sends a command to learn a scene. *nvoScene* = (SC_LEARN, *cpSceneNmbr*)
EV_NO_MSG ”No function”	The object does not send a command. However, previous cyclical commands are completed.
EV_NUL “Send invalid “	The object sends an “invalid” command, e.g. for cancelling priority commands. *nvoSwitch* = (0, -1) *nvoSetting* = (SET_NUL, 0, 0) *nvoOccupancy* = *cpOccCmdOff*

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4. Configuration for standard functions

The parameterisation of the events for all standard control functions with one or two-button stations is shown below.

a) Switching and pushbutton functions

Changing over with one pushbutton				
	pushEvent	releaseEvent	holdEvent	relLateEvent
Button 1	TOGGLE	NO_MSG	NO_MSG	NO_MSG
Button 2	NO_MSG	NO_MSG	NO_MSG	NO_MSG

Changing over with a two-button station				
	pushEvent	releaseEvent	holdEvent	relLateEvent
Button 1	ON	NO_MSG	NO_MSG	NO_MSG
Button 2	OFF	NO_MSG	NO_MSG	NO_MSG

Changing over with a switch				
	pushEvent	releaseEvent	holdEvent	relLateEvent
Button 1	TOGGLE	TOGGLE	NO_MSG	NO_MSG
Button 2	NO_MSG	NO_MSG	NO_MSG	NO_MSG

Switching on with a pushbutton				
	pushEvent	releaseEvent	holdEvent	relLateEvent
Button 1	ON	NO_MSG	NO_MSG	NO_MSG
Button 2	NO_MSG	NO_MSG	NO_MSG	NO_MSG

Switching off with a pushbutton				
	pushEvent	releaseEvent	holdEvent	relLateEvent
Button 1	OFF	NO_MSG	NO_MSG	NO_MSG
Button 2	NO_MSG	NO_MSG	NO_MSG	NO_MSG

b) Binary contacts

Make contact				
	pushEvent	releaseEvent	holdEvent	relLateEvent
Button 1	ON	OFF	NO_MSG	OFF
Button 2	NO_MSG	NO_MSG	NO_MSG	NO_MSG

Break contact				
	pushEvent	releaseEvent	holdEvent	relLateEvent
Button 1	OFF	ON	NO_MSG	ON
Button 2	NO_MSG	NO_MSG	NO_MSG	NO_MSG

c) Dimming functions

Dimming with pushbutton				
	pushEvent	releaseEvent	holdEvent	relLateEvent
Button 1	NO_MSG	TOGGLE	DIM.	STOP
Button 2	NO_MSG	NO_MSG	NO_MSG	NO_MSG

Dimming with two-button station				
	pushEvent	releaseEvent	holdEvent	relLateEvent
Button 1	NO_MSG	ON	DIM_UP	STOP
Button 2	NO_MSG	OFF	DIM_DOWN	STOP

d) Sunblind system functions

Sunblind system with a pushbutton				
	pushEvent	releaseEvent	holdEvent	relLateEvent
Button 1	STOP	NO_MSG	SB_TOG.	NO_MSG
Button 2	NO_MSG	NO_MSG	NO_MSG	NO_MSG

Sunblind system with two-button station				
	pushEvent	releaseEvent	holdEvent	relLateEvent
Button 1	SLAT_UP	NO_MSG	SB_UP	NO_MSG
Button 2	SLAT_DWN	NO_MSG	SB_DOWN	NO_MSG

e) Scene function

Scene pushbutton				
	pushEvent	releaseEvent	holdEvent	relLateEvent
Button 1	NO_MSG	SCENE_RCL	NO_MSG	SCENE_LRN
Button 2	NO_MSG	NO_MSG	NO_MSG	NO_MSG

Use of the heartbeat

If the object is used as a signalling device for transmitting binary statuses (e.g. window contact) or assignments, the use of a heartbeat may be necessary. The corresponding time can be adjusted via *cpMaxSendTime* and causes the network variables *nvoSwitch* and *nvoOccupancy* to be sent again after the set period of time.

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Use of nviRemoteCmd

It is possible via *nviRemoteCmd* to send commands, e.g. from a central control station, via the pushbutton to the connected actuators. In this way, for example, commands can be sent to a group of actuators, via *nviRemoteCmd* from the central control station to the (group) pushbutton, which then sends this command to the connected actuators via *nvoSwitch* and *nvoSetting*. All setting commands are forwarded unchanged. In the case of SET_NUL, SET_OFF and SET_ON, the analog command is also sent via *nvoSwitch*:

nvoSwitch.state = nvoSetting.function
nvoSwitch.value = nvoSetting.setting

Reset response

nviSwitchFb is polled in order to determine the current lighting status of the actuators.

If a heartbeat time (*cpMaxSendTime*) is set, the following action is executed – depending on the status of the first input – in order to adjust the network variables to suit the input status (for window contacts, occupancy sensors etc.):

First input opened:	*cpRelLateEvent1*
First input closed:	*cpPushEvent1*

Troubleshooting

No troubleshooting is required

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