
Version 1.0
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Profile Name : 6110



LONMARK® Functional Profile: Sunblind Actuator

SFPTsunblindActuator

Overview

This document describes the Functional Profile of a Sunblind Actuator functional block, which has self-contained hardware inputs and actuators. The Sunblind Actuator functional block is used to drive a motorized sunblind to a specific position (length) and/or angle.

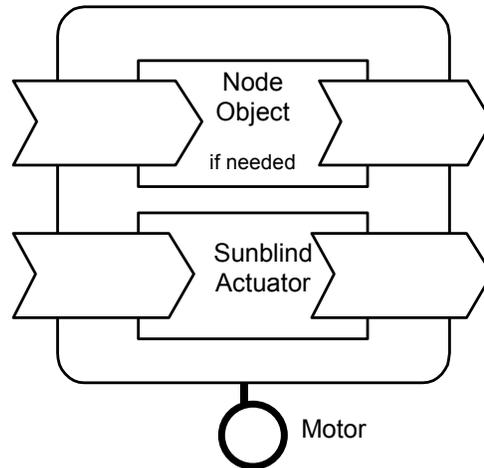


Figure 1 Device Concept

Example Usage

Typically, the Sunblind Actuator functional block receives input from a Switch functional block (32.00), from a building-management system (BMS), or from a Sunblind Controller functional block. The outputs from the Sunblind Actuator functional block are used to report the present state of the sunblind.

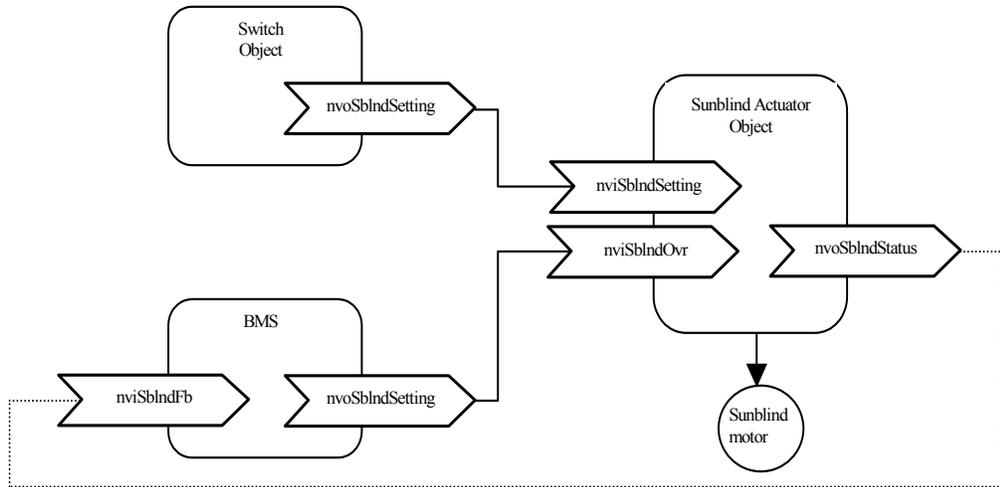


Figure 2 Example Usage of the Functional Block without a Sunblind Controller

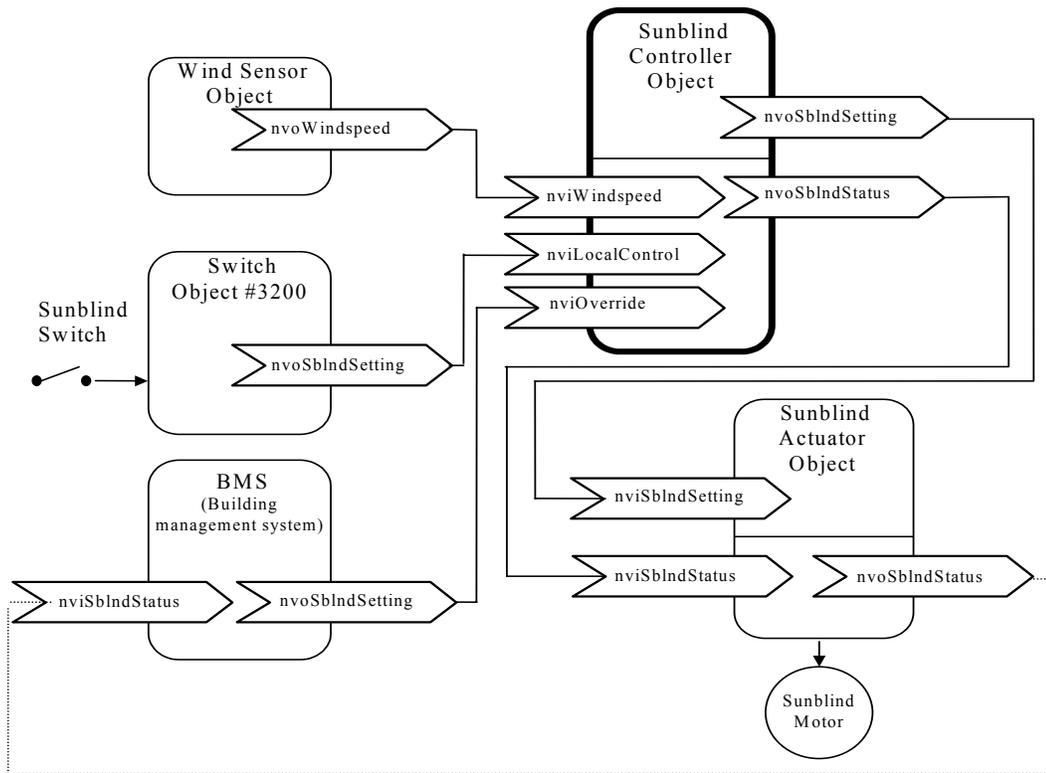


Figure 3 Example Usage of the Functional Block with a Sunblind Controller

Functional-Block Details

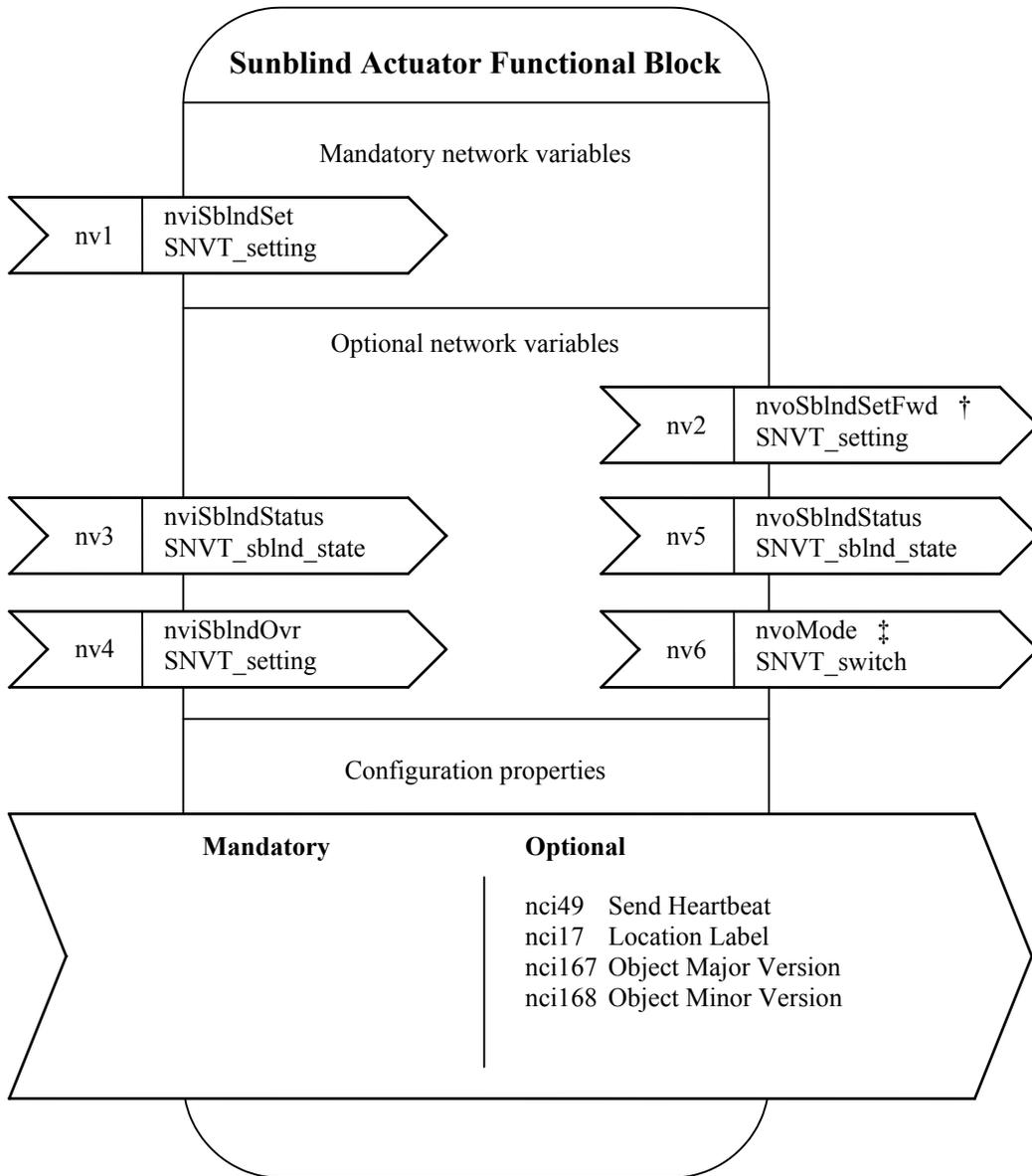


Figure 3 Functional-Block Details

Table 1 SNVT Details

NV # (M/O)*	Variable Name	SNVT Name	SNVT Index	Description
1 (M)	nviSblndSet	SNVT_setting	115	Sunblind Setting input
2 (O) †	nvoSblndSetFwd	SNVT_setting	115	Sunblind Control output for daisy chaining (forwarding)
3 (O)	nviSblndStatus	SNVT_sblnd_state	180	Sunblind Status input
4 (O)	nviSblndOvr	SNVT_setting	115	Sunblind Override input
5 (O)	nvoSblndStatus	SNVT_sblnd_state	180	Sunblind Status output
6 (O) ‡	nvoMode	SNVT_switch	95	Sunblind feedback output for switch LEDs or general monitoring

* M = mandatory, O = optional

† Mandatory for Profile-Specific implementations requiring: “Control (daisy chain) Output”

‡ Mandatory for Profile-Specific implementations requiring: “Feedback Output”

Table 2 SCPT Details

Man. Opt. *	SCPT Name NV Name Type or SNVT	SCPT Index	Associated NVs **	Description
Opt	SCPTmaxSendTime nciMaxSendTime SNVT_time_sec (107)	49	nv5 (M) nv6 (M)	Maximum period of time that expires before the functional block will automatically update NV
Opt	SCPTlocation nciLocation SNVT_str_asc (36)	17	Entire Functional Block	Used to provide physical location of the device
Opt	SCPTobjMajVer nciObjMajVer unsigned short	167	Entire Functional Block	Defines the major version number of the functional block
Opt	SCPTobjMinVer nciObjMinVer unsigned short	168	Entire Functional Block	Defines the minor version number of the functional block

* “Man” = mandatory, “Opt” = optional.

It should be Mandatory for CPs that are Mandatory for an NV that is also Mandatory. This is also valuable for CPs that apply to the Entire Functional Block.

** List of NVs to which this configuration property applies.

An “(M)” means that the CP is Mandatory if the NV (to which it applies) is implemented. An “(O)” means that the CP is Optional if the NV (to which it applies) is implemented.

Profile-Specific Implementations

80:00:00:3D:0A:40:00:00 (4 OR'd with other content of Usage field)

This functional profile specifies variations of itself for particular types of sunblind actuators.

Here is the present, amendable list of sunblind-actuator types:

<i>Profile-Specific Usage</i>	<i>Binary(b) & Dec.</i>	<i>SPID</i>	<i>Description</i>
Feedback Output	b000000 00	:40: or :C0:	Sunblind Actuator with nvoMode output
Control (daisy chain) Output	b000001 01	:41: or :C1:	Sunblind Actuator with nvoSblndSetFwd output
Feedback Output and Control (daisy chain) Output	b000010 02	:52: or :D2:	Sunblind Actuator with both nvoMode and nvoSblndSetFwd outputs

Other profile-specific sunblind-actuator types can be added to future versions of this profile as they are defined.

Mandatory Network Variables

Setting Input

```
network input sd_string("@p|1") SNVT_setting  
nviSblndSet;
```

This input network variable is used to send the sunblind to a desired position.

The interpretation of the SNVT_setting enumeration field, as it relates to sunblinds, is shown in the table at the end of this profile document. In the event of a discrepancy, the *LONMARK SNVT and SCPT Master List* should be used as the definitive definition of interpretation (versions 12.10 and later).

Valid Range

For details, refer to “Additional Considerations” and the *LONMARK SNVT and SCPT Master List* (versions 12.10 and later).

Default Value

The default value of SNVT_setting.

Configuration Considerations

None specified.

Optional Network Variables

Control-Forwarding Output

```
network output sd_string("@p|2") SNVT_setting  
nvoSblndSetFwd;
```

This output network variable is used to provide feedback or to forward the input NV of nviSblndSet to another device or functional block.

The interpretation of the SNVT_sblnd_state enumeration field, as related to sunblinds, is shown in a table below (for details refer to the *LONMARK SNVT and SCPT Master List*, versions 12.10 and later).

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Valid Range

For details, refer to “Additional Considerations” and the *LONMARK SNVT and SCPT Master List* (versions 12.10 and later).

Default Value

The present value of the nviSblndSet NV.

Configuration Considerations

The transmission of this NV is regulated by the nviSblndSet NV.

When Transmitted

The output variable is transmitted:

- When the state of nviSblndSet has changed.
- When polled.

Default Service Type

The default service type is unacknowledged and repeated.

Status Input

```
network input sd_string("@p|3") SNVT_sbldnd_state  
nviSbldndStatus;
```

This input network variable provides for receiving a Sunblind Controller status in order to report, via the Status output NV, the Sunblind Actuator status in conjunction with the Sunblind Controller status (for details see “Additional Considerations”).

The interpretation of the SNVT_sbldnd_state enumeration field as related to sunblinds is shown in a table below (for details refer to the *LONMARK SNVT and SCPT Master List*, versions 12.10 and later).

Valid Range

For details, refer to “Additional Considerations” and the *LONMARK SNVT and SCPT Master List* (versions 12.10 and later).

Default Value

The default value of SNVT_sbldnd_state.

Configuration Considerations

None specified.

Override Input

```
network input sd_string("@p|4") SNVT_setting  
nviSbldndOvr;
```

This input network variable is used to send the sunblind to a desired position.

This NV has priority over nviSbldndSet, unless receiving a SET_NUL command.

Valid Range

For details, refer to “Additional Considerations” and the *LONMARK SNVT and SCPT Master List* (versions 12.10 and later).

Default Value

Updated after a reset, the default value is “SET_NUL, invalid, invalid.”

Configuration Considerations

None specified.

Status Output

```
network output sd_string("@p|5") SNVT_sblnd_state  
nvoSblndStatus;
```

This output network variable is used to provide feedback as to the actual sunblind position, error messages, and the cause of the latest change of the setpoint.

The interpretation of the SNVT_sblnd_state enumeration field, as related to sunblinds, is shown in a table below (for details refer to the *LONMARK SNVT and SCPT Master List*, versions 12.10 and later).

Valid Range

For details, refer to “Additional Considerations” and the *LONMARK SNVT and SCPT Master List* (versions 12.10 and later).

Default Value

nvoSblndStatus.pos = INVALID (SET_NUL, 0xFF, 0x7FFF)

nvoSblndStatus.cmdSource = INVALID (BCS_NUL)

nvoSblndStatus.errorCode = INVALID (BEC_NUL)

Configuration Considerations

The transmission of this NV is regulated by the time specified in the nciMaxSendStatus CP, unless the nciMaxSendStatus CP has a value of 0.0, or other invalid value; in which case, the NV is not regulated by the nciMaxSendStatus value.

If more than one cause for an error messages is present, then this NV is updated as specified by the manufacturer’s documentation.

When Transmitted

The output variable is transmitted:

- When the state has changed.
- When an error message needs to be propagated.
- Regularly at the interval defined by the configuration variable nciMaxSendStatus.

Default Service Type

The default service type is unacknowledged and repeated.

Mode Output

```
network output sd_string("@p|6") SNVT_switch nvoMode;
```

This output network variable is used to provide a feedback output for switch LEDs or general monitoring.

The output is variable from 0 to 100%, where 100% is a fully closed (sun-blocking) blind (as shown in Figure 5).

Valid Range

The range of SNVT_switch.

Default Value

Actual position of sunblind, if known; otherwise, SNVT_switch definition of NULL.

Configuration Considerations

The transmission of this NV is regulated by the time specified in the nciMaxSendMode CP, unless the nciMaxSendMode CP has a value of 0.0, or other invalid value; in which case, the NV is not regulated by the nciMaxSendMode value.

If more than one cause for an error messages is present, then this NV is updated as specified by the manufacturer's documentation.

When Transmitted

The output variable is transmitted:

- ❑ When the sunblind position has changed.
- ❑ Regularly at the interval defined by the configuration variable nciMaxSendMode.

Default Service Type

The default service type is unacknowledged and repeated.

Configuration Properties

Send Heartbeat (Optional)

```
network input config sd_string("&2, i. j, 0\x80, 49")
SNVT_time_sec nciMaxSendTime;
```

This input configuration property sets the maximum period of time that can expire before the functional block will automatically update the following network variable:

nv5 – nvoSblndStatus (Mandatory)

nv6 – nvoMode (Mandatory)

Notice that this CP is Mandatory for nvoSblndStatus and nvoMode, which are Optional NVs. If nvoSblndStatus or nvoMode are implemented, then the CP must also be implemented since it is marked as Mandatory.

A Mandatory CP associated with a Mandatory NV means that the CP is Mandatory for implementing this functional block (as in Table 2).

i and *j* are the indices of the NVs in relation to their declaration order within the device, when implemented.

Valid Range

The valid range is 1.0 to 3600.0 seconds.

Values outside this range are invalid and will disable the automatic update mechanism. A value of zero (0) will be used for the internal timer in cases where configured values are above 3600.0 seconds.

Default Value

The default value is 0.0 (no automatic update).

Configuration Requirements/Restrictions

This CP has no modification restrictions (no_restrictions). It can be modified at any time.

SCPT Reference

SCPTmaxSendTime (49)

Location Label (Optional)

```
network input config sd_string("&1, p, 0\x80, 17")
SNVT_str_asc nciLocation;
```

This configuration property can be used to provide the location of the functional block (or device), where *p* is the functional-block index. The above code declaration is for providing the location of the functional block. If it is preferred, the location of the device can be represented with the following code declaration—if a Node Object functional block is present on the device:

```
network input config sd_string("&1, 0, 0\x80, 17")
SNVT_str_asc nciLocation;
```

Valid Range

Any NULL-terminated ASCII string up to 31 bytes of total length (including NULL). The string must be truncated if the length does not allow the 31st character to be the NULL (0x00).

Default Value

The default value is an ASCII string containing 31 NULLs (0x00).

Configuration Requirements/Restrictions

This CP has no modification restrictions (no_restrictions). It can be modified at any time.

SCPT Reference

SCPTlocation (17)

Object Major Version (Optional)

```
network input config sd_string("&1, p, 0\x84, 167")
unsigned short nciObjMajVer;
```

This configuration property can be used to provide the major version number of the functional block when implemented on a device.

Valid Range

Any integer number from 0 to 255. Only 1-byte of information is accepted.

Default Value

The default value is one (1).

Configuration Requirements/Restrictions

This CP is a constant (const_flg). It is not to be modified except that it is allowable to modify the value in a download of new code to the device.

SCPT Reference

SCPTobjMajVer (167)

Object Minor Version (Optional)

```
network input config sd_string("&1, P, 0xA4, 168")
unsigned short nciObjMinVer;
```

This configuration property can be used to provide the minor version number of the functional block when implemented on a device.

Valid Range

Any integer number from 0 to 255. Only 1-byte of information is accepted.

Default Value

The default value is zero (0).

Configuration Requirements/Restrictions

This CP has modification restrictions of constant and device specific (0xA4). It is not to be modified except that it is allowable to modify the value in a download of new code to the device.

SCPT Reference

SCPTobjMinVer (168)

Key for Unresolved References

i and j are the indices of the CP-associated NVs in relation to their declaration order within the device, when implemented.

p is this functional block's index relative to the Device Self-Documentation String (DSDS) declaration, when implemented.

Data Transfer

None specified.

Power-up State

There is no immediate network action on Power-up State, except to set default values without propagation of those values (in the case of output NVs).

Boundary and Error Conditions

None specified.

Additional Considerations

SNVT_setting consideration

When using SNVT_setting for sunblinds, note that there are different types of sunblinds available on the market, which may differ in their mechanical possibilities. These differences may be exposed through the resulting UP and DOWN movement and slat movement.

For example, with standard shutters: only the sunblind position is adjustable. A slat angle is usually not available. However, using Venetian blinds: the sunblind position is adjustable as well as the slat angle.

The following table, "*Interpretation of SNVT_setting applying on sunblinds*" is related to the use of Venetian blinds, which are a complex sunblind type.

All other sunblind types may be controlled easily with the same consideration, but noting that some sunblinds do not have the "Slat angle" feature.

Sunblind position and slat angle related to the sun position and a building

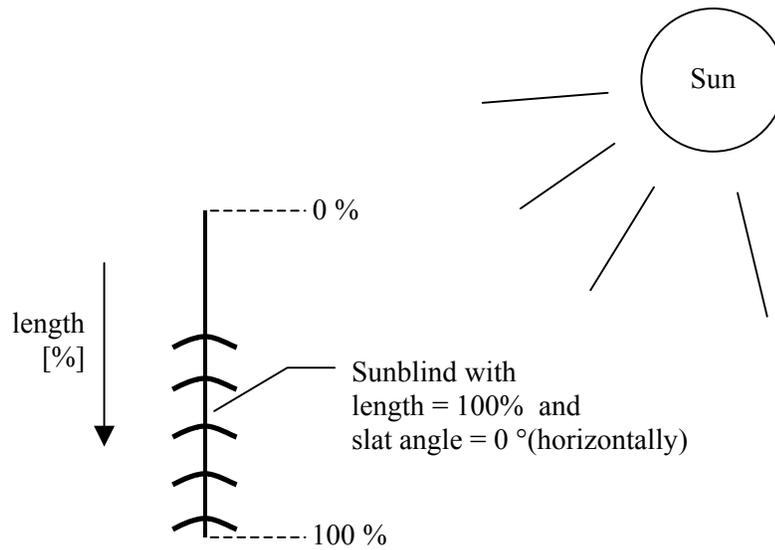


Figure 5: Venetian blind related to the sun position

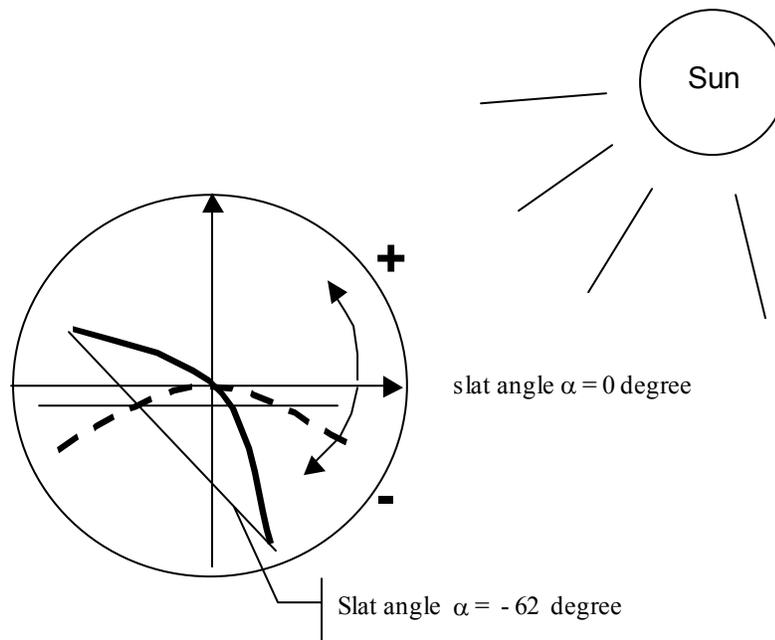


Figure 6: Slat angle scheme

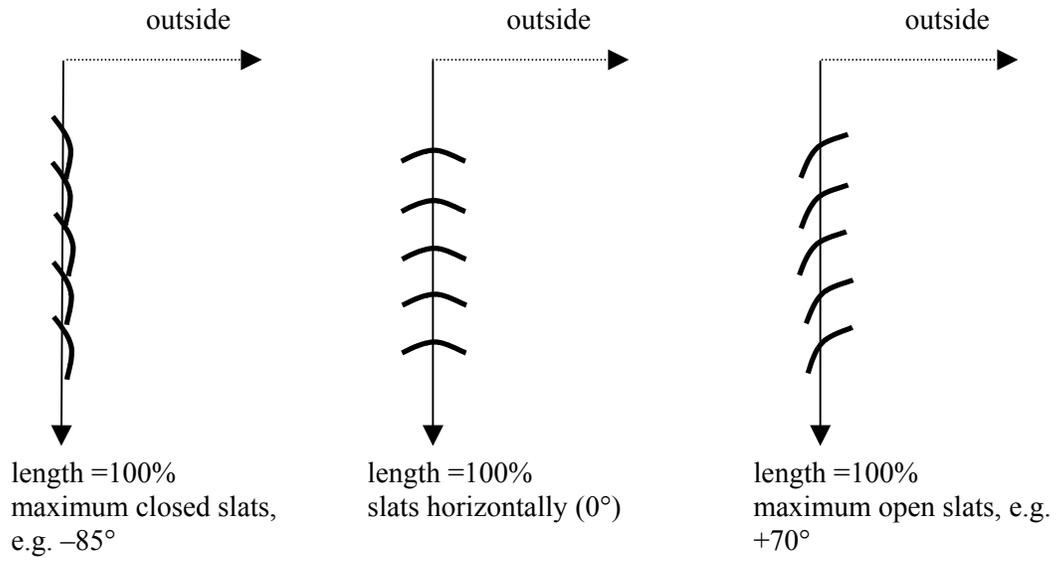


Figure 7: Slat angle examples related to a building

Table 3 Interpretation of SNVT_setting applied to sunblinds

Function	M/O *	Setting** position “x”	Rotation*** slat angle “α”	Description	Sunblind behavior
SET_OFF	O	Don't care	Don't care	Mode OFF	Switches a Mode OFF, related to the action of receiving OFF through nviAutoMode.
SET_ON	O	Don't care	Don't care	Mode ON	Switches a Mode ON, related to the action of receiving ON through nviAutoMode.
SET_DOWN	M	INVALID	INVALID	Sunblind moves down	Sunblind moves down to the position specified in the actuator device or until STOP command is received.
	O	INVALID	$0^\circ \leq \alpha \leq 360^\circ$	Relative slat angle downwards	Sunblind rotates the slats downwards by a relative angle of α
	O	0%	$0^\circ \leq \alpha \leq 360^\circ$ INVALID	Slats move relatively	Sunblind rotates the slats as specified in the device. If $\alpha = 0$ or INVALID : At the new sunblind position, the slat angle is the same as before.
	O	100%	$0^\circ \leq \alpha \leq 360^\circ$ INVALID	Sunblind moves down, slats move relatively	Sunblind moves down as specified in the device. If $\alpha = 0$ or INVALID: At the new sunblind position, the slat angle is the same as before.
	O	$0 < x < 100\%$	$0^\circ \leq \alpha \leq 360^\circ$	Sunblind /slats move down relatively	Sunblind reacts as specified in the device. If $\alpha = 0$: At the new sunblind position, the slat angle is the same as before.
	O	$0 < x < 100\%$	INVALID	Sunblind moves down relatively	Moves the sunblind up by x percent to a new sunblind position.
SET_UP	M	INVALID	INVALID	Sunblind moves up	Sunblind moves up to the position specified in the actuator device or until STOP command is received.
	O	INVALID	$0^\circ \leq \alpha \leq 360^\circ$	Relative slat angle upwards	Sunblind rotates the slats upwards by a relative angle of α
	O	$0 \leq x \leq 100\%$	$0^\circ \leq \alpha \leq 360^\circ$	Sunblind/slats moves up upwards	Moves the sunblind up by x percent to a new sunblind position. If $\alpha = 0$: At the new sunblind length, the slat angle is the same as before.
	O	$0 \leq x \leq 100\%$	INVALID	Sunblind moves up	Moves the sunblind up by x percent to a new sunblind position.
SET_STOP	M	Don't care	Don't care	Sunblind stops	STOP sunblind immediately.
SET_STATE	O	$0 \leq x \leq 100\%$	INVALID	Setting sunblind's position only	Setting of the absolute position as defined by the “setting” field.
	O	INVALID	$-360 < \alpha \leq 360^\circ$	Setting sunblind's slat angle only	Setting of the absolute rotation angle as defined by the “rotation” field.
	O	$0 \leq x \leq 100\%$	$-360 < \alpha \leq 360^\circ$	Setting Sunblind to position x and to slat angle α	Set the absolute sunblind position to x and slat angle to α .
SET_NUL	O			Ignored	Cancels the last command of this input when there are at least 2 inputs of this SNVT type (competing inputs).

* M = mandatory, O = optional

** The values of the *setting* column correspond to the SNVT_lev_cont format. Herewith, INVALID means a value of 0xFF.

*** The values of the *rotation* column correspond to the SNVT_angle_deg format. Herewith, INVALID means a value of 0x7FFF.

For sensor devices using SNVT Setting: Values that are not in the specified range will be interpreted as INVALID values.

Relative Positioning relate always on the fully mechanical/physical movement range of a sunblind.

Interpretation of nvoSblindStatus (SNVT_Setting):

(used for feedback and monitoring)

Function	M/O*	Setting** position “x”	Rotation*** slat angle “α”	Description	Sunblind behavior
SET_ON SET_OFF SET_NUL	O	INVALID ^a or Actual absolute position	INVALID ^a or Actual absolute angle		Feeds-back the sunblind’s position, slat angle, and Mode Status

^a SET_NUL or INVALID: *value is not applicable.*

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