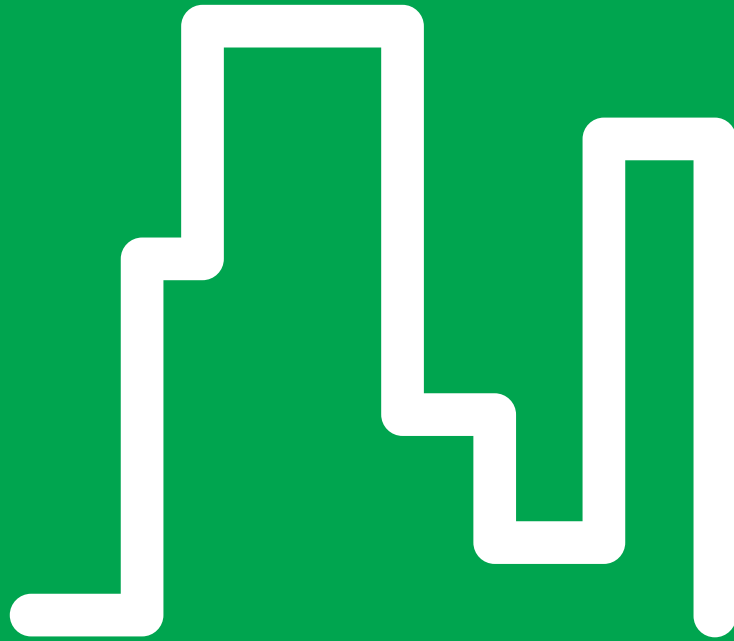# SeeTool - Solutions for KNX

Office building segment

Application 2.0.1.0.0.4

Movement dependent automatic light control with manual control and blind/ shutter control

Schneider Electric

Application 2.0.1.0.0.4
Movement dependent automatic light control with manual control
and blind/shutter control

Lighting and blind/shutter control functions

Lighting control functions : Application combines two modes: automatic and manual
At automatic mode the light is automatically switched OFF or ON dependant on people's movement and existing brightness. At manual mode the light can be switched permanently OFF or ON. The manual ON will start the automatic movement detection.

Blind/Shutter control functions: A blind or roller shutter motor with end position can be connected to each channel of the blind actuator. The position of the blind's or shutter's height can be adjusted manually by push-buttons. At slat-blinds an adjustment of the slat's angle is possible as well.
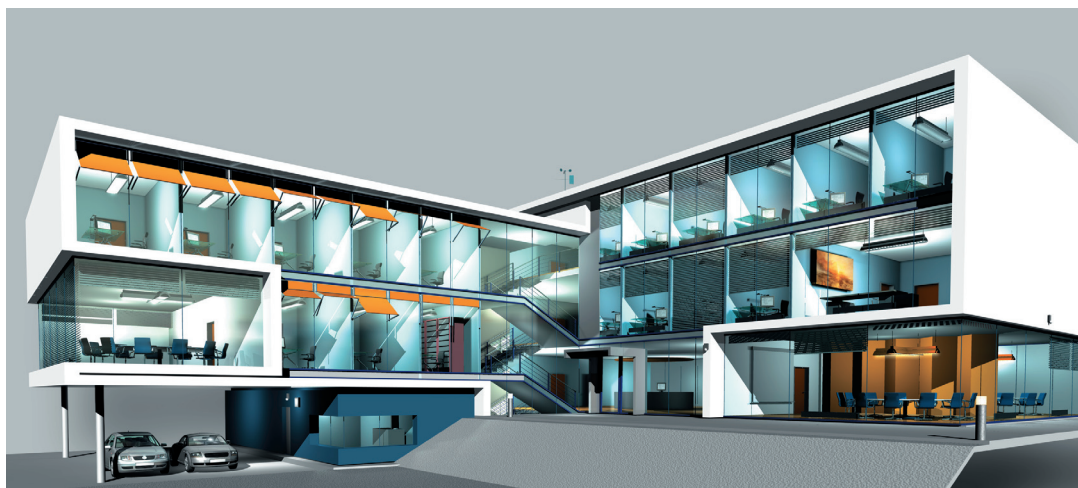
Application areas

The application is defined for single room offices and conference rooms where automatic control is important, but manual control required as well (e.g. during presentations). It is also usable in all types of non occupied storage rooms and occasionally used rooms as it offers basic control of the lighting with an automatic movement detector and a manual control by push-button.

> Energy savings

Lights will not remain on all night, or even when not needed. Energy savings are achieved by turning ON and OFF the lights automatically. This reduces the time for the lights turned on and can lead to savings of up to 40% compared to installations without automatic function. The shutter/blind functionality can support energy savings when using as a shield against over-heating of rooms at summer-daytimes or cooling at winter-nighttimes.

> Future proof

The application is prepared and defined for integration into a Building Management System if required, through the open technology communication network.

> Flexibility

For optimised cost, the amount of units is reduced to a minimum, but allows maximum of flexibility when walls are removed and rooms are combined.

> Reliability

Design, planning and installation documents are pre-defined which makes the entire building process faster and more reliable. User documents and descriptions are prepared to assist in user training. The application works as an individual, stand alone room control unit and can be installed, used alone, or combined with the entire network.

Lighting

up to **40%** energy saving

EN 15232
A class solution

tested & validated

Application 2.0.1.0.0.4
Movement dependent automatic light control with manual control
and blind/shutter control

Technical specifications

Functions

Lighting control: The application has two modes: automatic mode and manual mode.

Automatic mode: The light is automatically switched ON when a person enters the room and the brightness value is below a predefined brightness threshold. It is automatically switched OFF when no movement is detected in the room and preset delay time has passed. The light can also be switched ON independent of brightness by pushing button no.1.
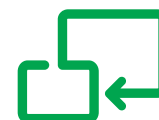
Delay is adjustable by ETS software. Default is 25 min.

The brightness threshold is also adjustable by ETS software. Our recommendation is 300 lux.

Manual mode: Push-button no.2 affects a permanent OFF. To turn the lights ON again, push-button no.1 has to be pressed. The automatic mode with movement detection will start again. After an automatic OFF the brightness dependent switch to ON will start at movement again.

Blind/shutter control: A blind or roller shutter motor with end position can be connected to each channel of the blind actuator. The position of the blind's or shutter's height can be adjusted manually by push-buttons.

With a long pressure on button 3 the blind or roller shutter moves upwards. With a long pressure on button 4 the blind or roller shutter moves downwards. With a short pressure the movement of the blind or shutter stops.

In the case of a blind or hanging with slats the angle of the slats can also be moved stepwise with several short pressures. With button 4 the slats turn to the position "100% closed" or to the mechanically determined working position. With button 3 the slats move to the opposite direction. The possible angels of the slats depend from the mechanical construction of the blind with slats.

functions

Components

The application consists of one movement detector (wall mounted), one push button (wall mounted), one DIN-rail switch actuator (mounted in the cabinet or close to the room) and one DIN-rail blind actuator (mounted in the cabinet or close to the room).

MTN647393	KNX Switch actuator REG-K/2x230/16 with manual mode
MTN649802	KNX Blind actuator REG-K/2x/10 with manual mode

Application 2.0.1.0.0.4
Movement dependent automatic light control with manual control
and blind/shutter control

Technical specifications

Design ranges

(Frames not included. Other designs and colours available.)

EXXACT

WDE002933	KNX Push-button, 2-gang

WDE002959	KNX PIR 180°/2.20m flush mounted

functions

Installation

Movement detector recommended to be installed on the wall at a height of 2.20m.

Application 2.0.1.0.0.4
Movement dependent automatic light control with manual control
and blind/shutter control

Technical specifications

Wiring diagram

KNX Push-button 2-gang WDE002933

KNX PIR 180°/2.20m flush-mounted WDE002959

System component

Lighting control

Blind control

Manual control

Presence detection

KNX

KNX Power supply

KNX Switch actuator REG-K/2x230/16 with manual mode MTN647393

KNX Blind actuator REG-K/2x/10 with manual mode MTN649802

L

N

things work together

Application 2.0.1.0.0.4
Movement dependent automatic light control with manual control
and blind/shutter control

Technical specifications

Configuration

The ETS tool is used to set the parameters for the devices in the application and to define the functional relationship between the devices by group addresses.

The following parameters and group address relations must be set and assigned. The parameters should be set first and in the described order. The parameters which can be changed to fine tune the application are described further on.

settings

KNX PIR 180°/2.20m

0	Switch object 1	Block 1	1 bit	–> 1/1/1
7	Trigger object	Block 1	1 bit	<– 1/1/3
8	Locking object	Block 1	1 bit	<– 1/1/4
109	Status feedback	Safety pause	1 bit	<– 1/1/2

Block 1 general
Operation mode: master mode
Locking function: enable

Block 1 general –> Disable function
Behaviour at start
of block: send telegram

Block 1 general –> Brightness
Brightness threshold (10-2000 Lux):   300

Block 1 general –> Times
Master triggering is
(brightness-dep.):   disabled
Time base for staircase timer: 1 min
Time factor for staircase timer
(1-255):   25

KNX Push-button, 2-gang

0	Switch object A	PB 1	1 bit	–> 1/1/4
1	Switch object B	PB 1	1 bit	–> 1/1/3
2	Status feedback obj.	PB 1	1 bit	<– 1/1/2
3	Switch object A	PB 2	1 bit	–> 1/1/4
6	Stop/Step object	PB 3	1 bit	–> 3/1/2
7	Movement object	PB 3	1 bit	–> 3/1/1
9	Stop/Step object	PB 4	1 bit	–> 3/1/2
10	Movement object	PB 4	1 bit	–> 3/1/1

General
Push-button: 2-gang

Push-button 1
Selection of function: switch
Number of objects: two
Triggering of status
LED: f   rom status
                        feedback object
Object A Value: OFF-telegram
Object B Value: ON-telegram

Push-button 2
Selection of function: switch
Number of objects: one
Triggering of status
LED: flashes when
                        switch/value obj. A
                        not equal to 0

Pushbutton 3
Selection of function: blind
Direction of movem.:   UP

Pushbutton 4
Selection of function: blind
Direction of movem.:   DOWN

Switch actuator REG-K/2x230/16

| 1/1/1 –> | 0 | Switch object | Channel 1 | 1 bit |
| 1/1/2 <– | 3 | Status feedback | Channel 1 | 1 bit |

Device selection
Device selection: 2-fold switch actuator

Channel 1: General
Status information: active status resp. object
Relay state after bus
voltage recovery: opened

Blind actuator REG-K/2x/10

| 3/1/1 –> | 0 | Movement obj. in manual mode | Channel 1 | 1 bit |
| 3/1/2 –> | 1 | Stop/Step obj. in manual mode | Channel 1 | 1 bit |

Channel config.
Channel 1 operation
mode: blind or
                         roller shutter
[See description „fine tuning"]

1: Blind [only in case of blind]
How does the existing blind move?:
 downwards closed / upwards horizontal
 downwards tilted / upwards horizontal
 downwards closed / upwards closed
 downwards tilted / upwards closed
[See description „fine tuning"]
Slat position after movement: last slat position

1: Drive [only in case of blind]
Time base for running
time of height adjustment: 100 ms
Factor for running time of height
adjustment (10-64000), 1 s = 1000 ms: _____
[See description „fine tuning"]
Time base for step interval of slat :   10 ms
Factor for step interval of slat: _____
[See description „fine tuning"]
Time base for running time of slats: 10 ms
Factor for running time of slat: _____
[See description „fine tuning"]
Pause on reverse on change in
direction (1-255), factor * 100 ms,
manufacturer's data: _____
[See description „fine tuning"]

1: Drive [only in case of roller shutter]
Time base for running time of height
adjustment: 100 ms
Factor for running time of height
adjustment (10-64000), 1 s = 1000 ms: _____
[See description „fine tuning"]
Pause on reverse on change
in direction (1-255), factor * 100 ms,
manufacturer's data: _____
[See description „fine tuning"]

Application 2.0.1.0.0.4
Movement dependent automatic light control with manual control
and blind/shutter control

Technical specifications

Group addresses

Address	Name (proposal)	Function
1/1/1	Room 001 Light On/Off	Light on/off by the movement detector
1/1/2	Room 001 Light Status	Feedback from actuator, On/Off
1/1/3	Room 001 Light Switch On	Brightness independent switch on from push-button
1/1/4	Room 001 Light Permanent OFF/Auto	Permanent OFF = 1, Automatic = 0
3/1/1	Room 001 Blind/Shutter Up/Down	Blinds/Shutter move downwards or upwards
3/1/2	Room 001 Blinds/shutter Stop OR Room 001 Blinds/shutter Stop/Step	Blinds/Shutters Stop OR Blinds Stop and Change angel of Slats stepwise

settings

Application 2.0.1.0.0.4
Movement dependent automatic light control with manual control
and blind/shutter control

Technical specifications

Fine tuning

Some parameters can be changed to fine tune the solution to the building and specific requirements. Parameter which may need to be adjusted are listed below, our recommendation in brackets.

KNX PIR 180°/2.20m:
The staircase timer (delay time) will be retriggered by every detected movement when the light is on. The light will be switched off if no movement has been detected within the specified time.

Parameter page	Parameter	Value
Block 1 general –> Times	Time base for staircase timer	1s-1h (1 min)
Block 1 general –> Times	Time factor for staircase timer	1-255 (25)

Delay time = Time base x Time factor

The light will only be switched ON by movement if the brightness in the room is below the specified brightness threshold. Note that the brightness is measured at the installation place of the detector.

Parameter page	Parameter	Value
Block 1 general –> Brightness	Brightness threshold	10-2000 lux (300)

Blind actuator REG/K:
At the beginning of the parameter setting you should define which kind of motor driven hangings are used. In the configuration of each channel „blind" or „roller shutter" can be selected.

Parameter page	Parameter	Value
Channel config.	Channel 1 operation mode	Blind / Roller shutter

In the case of the blind configuration additional parameters for the fine tuning of the behavior of the slats are available. In the case of roller shutter these parameters are not necessary and can not be selected.

fine tuning

Application 2.0.1.0.0.4
Movement dependent automatic light control with manual control
and blind/shutter control

Technical specifications

Defining blind type (only for blind with slats)

The application differentiates between four types of blind. You can determine the blind type from the position of the slats during movement. Types 2 or 4 (slats are downwards titled) should be selected when the slats have a mechanically determined working position. The working position restricts the possible opening angle of the slats, as long as the blind has not reached its lower end position.
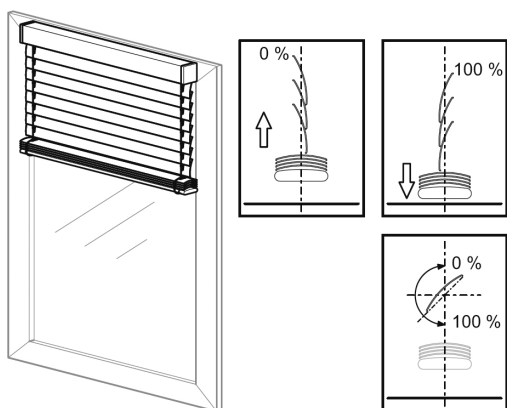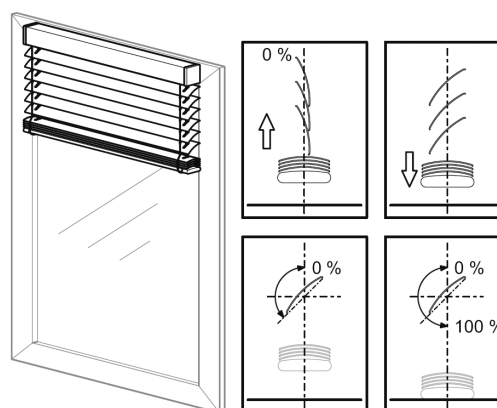
fine tuning
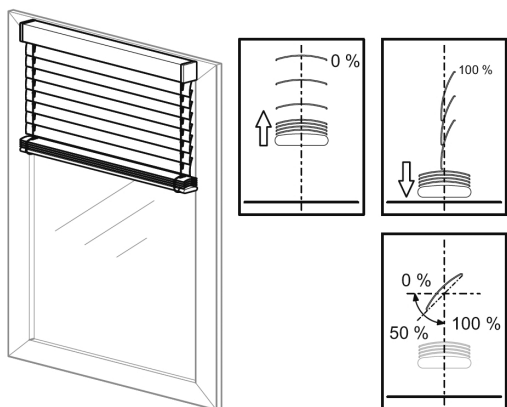
Blind type (1) without working position
downwards closed / upwards horizontal
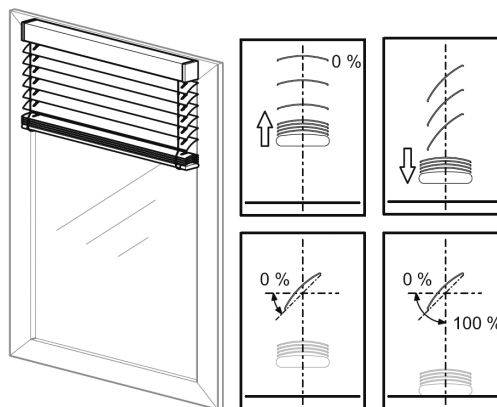
Blind type (2) with working position
downwards tilted / upwards horizontal

Blind type (3) without working position
downwards closed / upwards closed

Blind type (4) with working position
downwards tilted / upwards closed

Parameter page	Parameter	Value
1:Blind	How does the existing blind move?	(1) downwards closed / upwards horizontal (2) downwards tilted / upwards horizontal (3) downwards closed / upwards closed (4) downwards tilted / upwards closed

Caution! Some blinds have special drive characteristics which are not congruent with one of the four types of blinds. In this case an exact positioning of the slats might be impossible.

Application 2.0.1.0.0.4
Movement dependent automatic light control with manual control
and blind/shutter control

Technical specifications

Slat position after movement (only for blind with slats)

Parameter page	Parameter	Value
1:Blind	Slat position after movement	no reaction operating position (last slat position)

The slat opening that you specify here is inter alia applied after a manual movement command ended by stop telegram. This is the standard way of control via long and short pressure with a push button. Please note: a mechanically determined working position restricts the possible opening angle of the slats, as long as the blind has not reached its lower end position (Blind types 2 and 4: slats are downwards tilted).

Recommendation: the slat running time should be set.

When you select „slat position after movement": **„last slat position"** or **„operating position"** it is necessary to know the slat running time.

When you want to define the **number of steps for opening or closing the slats** you also need the running time.

Height running times

The blind actor allows a precise positioning of the height with value objects. This positioning depends from the calculation of the running time of the used blinds and shutters. As various types of blinds and shutters are available it is not possible to recommend any default-value.

You should measure the height running time from end to end position and set the following values:

Parameter page	Parameter	Value
1:Drive	Time basis for height running time	10, (100) ms
1:Drive	Factor for running time	10 - 64000 _____ 1 second = 1000 ms

The drive needs this period of time to move out of one end position (blind/roller shutter is fully open or closed) into the opposite end position. When the set time expires the relay of channel 1 is automatically switched off (even if the drive with the values set here has not fully reached its end position).

If you want to optimize the positioning behavior additional drive parameters can be set.

fine tuning

Application 2.0.1.0.0.4
Movement dependent automatic light control with manual control
and blind/shutter control

Technical specifications

Slat running time (only for blind with slats)

The slat running time is the period of time it takes the slat to complete a full movement from 0% to 100% or vice versa. The regulating range through witch the opening angle passes depends on the type of blind in use.

Type (1):   slats 100%   = downwards closed and lower end position closed
             slats 0%   = upwards horizontal

Type (2):   slats 100%   = downwards tilted (= mech. working pos.) - lower end position = closed
             slats 0%   = upwards horizontal

Type (3):   slats 100%   = downwards closed and lower end position closed
             slats 0%   = upwards closed

Type (4):   slats 100%   = downwards tilted (= mech. working pos.) - lower end position = closed
             slats 0%   = upwards closed

The opening angle after a movement of type (1) and (3) is directly influenced by the running time of the slats.

The opening angle after a movement of type (1) and (3) is also influenced by the mechanically determined working position. The slats can only move up to the working position (e.g. 75%), as long as the lower end position of the height is not reached. When this end positions is reached, the slats can move up to the maximum value (100%). The measuring of the slat running time should be done at this lower end position.

Parameter page	Parameter	Value
1:Drive	Time basis for running time of slat	(10), 100 ms
1:Drive	Factor for running time of slat	5 - 255 _____

Slat step interval (only for blind with slats)

Depending on the slat running time, the number of steps for opening or closing the slats can be defined. The time for one short movement of the slats is called step interval.

E.g. slat running time = 1 second and step interval = 0.1 seconds –> slats can be completely opened in 10 steps.

Parameter page	Parameter	Value
1:Drive	Time basis for step interval of slat	(10), 100 ms
1:Drive	Factor for step interval of slat	5 - 255 _____

Pause on reverse for change of direction

When the blind actuator moves and receives a command to move to the opposite direction, it stops and waits for the pause of reverse interval to pass.

Caution! Pauses on reverse interval that are too short could cause damage to the drive. When setting the values, observe the manufacturers specification for the drive under all circumstances.

Parameter page	Parameter	Value
1:Drive	Pause on reverse on change in direction (1-255) factor * 100 ms	_____ ms

fine tuning

Application 2.0.1.0.0.4
Movement dependent automatic light control with manual control
and blind/shutter control

Technical specifications

Additional weather alarm and automatic function

Caution! When the blinds or other hangings are mounted on the outside of the window the use of automatic weather alarm functions are recommended.

A weather station is not a part of this room-solution and has to be ordered separately. We recommend using at least one weather station for each facade with outside mounted blinds. For the detailed planning (e.g. thresholds) you have to observe the manufacturers specifications for the drive under all circumstances.

This shutter and blind solution is prepared for A-class. A-classification needs additional functionality, which realises an automatic pulling down of the shutter or blind dependant on the outside temperature and lux value, in order to save the room from outside thermal influences. This automatism will be controlled by a central control unit (central building management function) plus a weather station sensing conditions outside the building.

A description on an exemplary functionality is shown in Appendix 1 SB, which will be automatically added to your project's document-folder, when selecting a solution with shutter/blind functionality to your project.

fine tuning

Power failure behaviour

Switch actuator: Relay state after bus voltage failure: no change (relay remains)

Switch actuator: Relay state after bus voltage recovery: opened (light is OFF)

Blind actuator: Behavior when bus voltage fails: no reaction (relay remains)

Blind actuator: Behavior on bus voltage recovery: stop (no movement)

When you want to set another behavior for the blind actuator you can enable the parameter page „failure mode". For more detailed information please read the application manual.

Application 2.0.1.0.0.4
Movement dependent automatic light control with manual control
and blind/shutter control

Technical specifications

User manual

The user manual provided for the application is an end users training material and can be installed at site when final submission is made.

Please do no forget to cut out this quick guide for the user and attach to the wall next to the entrance to the room. Also, make sure the customer is aware of the installed applications function.

Quick guide

This room is equipped with movement dependent automatic light control with manual control and blind/shutter control
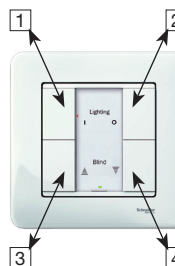
Automatic mode operation
Lighting control
The light is automatically switched ON when a person enters the room and the brightness value is below a predefined brightness threshold. It is automatically switched OFF when no movement is detected in the room and preset delay time has passed. The light can also be switched ON independent of brightness by pushing button no.1.

Switch OFF delay default time is 25 min. The brightness threshold default is 300 lux.

Manual mode operation
Push-button no.2 affects a permanent OFF. To turn the lights ON again, push-button no.1 has to be pressed. The automatic mode with movement detection will start again. After an automatic OFF the brightness dependent switch to ON will start at movement again.

06-10 Application 2.0.1.0.0.4

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for your
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Application 2.0.1.0.0.4
Movement dependent automatic light control with manual control
and blind/shutter control
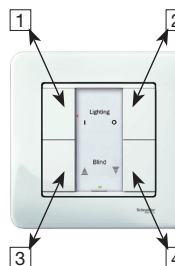
Technical specifications

User manual

Quick guide

This room is equipped with movement dependent automatic light control with manual control and blind/shutter control

Automatic mode operation
Blind/shutter control
The position of the blind's or shutter's height can be adjusted manually by push-buttons. With a long pressure on button 3 the blind or roller shutter moves upwards. With a long pressure on button 4 the blind or roller shutter moves downwards. With a short pressure, the movement of the blind or shutter stops.

In the case of a blind or hanging with slats the angle of the slats can also be moved stepwise with several short pressures. With button 4 the slats turn to the position „100% closed" or to the mechanically determined working position. With button 3 the slats move to the opposite direction. The possible angels of the slats depend from the mechanical construction of the blind with slats.

06-10 Application 2.0.1.0.0.4

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