Shutters

Shutter/Blind Control Module

User Manual Version : [0.2]_a

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DOCUMENT UPDATES

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1 INTRODUCTION

A variety of Zennio devices incorporate **binary relay outputs** configurable as independent shutters channels.

Every shutter channel is capable of controlling the motion of one blind in the domotic system, by means of two complementary functionalities:

- **Basic control** (simple up/down orders).

- **Precise position control** of the shutter and of the slats (if any).

Each shutter channel (A, B, etc.) consists of two consecutive relay outputs (i.e., channel A is formed by outputs 1 and 2; channel B is formed by outputs 3 and 4; etc.). The first output of each channel will send electric signals to raise the shutter, whereas the second output will send the signal to lower the shutter. The cables from the motor of the shutter drive should be connected to the actuator in accordance to the above.

Channel	Outputs	Action
A	Output 1	Move up
A	Output 2	Move down
B	Output 3	Move up
B	Output 4	Move down
(…)	(…)	(…)

Table 1 Shutter Channel. Actions of the Outputs.

Please refer to the specific user manual and datasheet of each Zennio device in order to confirm whether this feature is available or not, and for specific of the connection and installation.

2 CONFIGURATION

2.1 GENERAL CONFIGURATION

Each shutter channel can be configured as "**Shutter (No Slats) / Awning**" or as "**Blinds (With Slats)**".

Besides the shutter type, it is possible to configure the following for the shutter channels:

- **Times**: times that define the motion of the shutter: the length of the rising course, the length of the lowering course and a safety reversion delay to prevent mechanical and electrical issues due to a sudden direction change when the shutter was already in motion. Moreover, it is possible to set an additional end-of-stroke time to be applied once the shutter gets to its limit (top or bottom).

  For blinds with **slats**, a spin-around time for the entire slat course and a number of steps need to be configured as well.

  Regarding the slats, it is possible to set whether the actuator should *force* the slats to maintain their position after the shutter completes the motion or when stopping the motion. Note that due to the fact that both the shutter and the slats move together, maintaining the position of the slats may sometimes require performing a certain correction of the position of the shutter.

ETS PARAMETERISATION

Figure 1 Shutter Channel - Configuration

Once a shutter channel has been enabled, a specific configuration screen is included in the left menu. This screen contains the following parameters.

- **Target to Control**: defines the shutter channel as "Shutter (No Slats) / Awning" (default) or "Blinds (With Slats)".

- **Raise Time**: total time the shutter needs to move to the top (position = 0%) from the bottom (position = 100%). The allowed range is 5 to 30000 (600 by default) hundred milliseconds.

- **Lower Time**: total time the shutter needs for the inverse journey (0% to 100%). The allowed range is 5 to 30000 (600 by default) hundred milliseconds.

- **Reversion Pause Time**: sets the time (1 to 255 hundred milliseconds, 5 by default) the actuator will wait if it was already in motion and an order to switch the direction arrives.

- **Additional Time**: sets an end-of-stroke time (0 to 600 hundred milliseconds; 0 by default) in order to guarantee the shutter gets to the top or to the bottom.

In case of configuring the shutter as "Blinds (With Slats)", other parameters show up:

- **Spin-Around Time**: total time the slats take for the entire travel between "totally open" (0%, with the light passing through) and "totally closed" (100%). Valid values are 1 to 255 tenths of a second.

- **Number of Steps**: number of steps required for a full slat spin-around. The time range available for this parameter depends on the Spin-Around Time, as the slat step time should not be lower than 100 ms. The maximum range is 1 to 9 steps, which corresponds to spin-around times greater than 900ms. The default value will be the maximum within the allowed range.

- **Recover Position After Shutter Completes Motion**: sets whether to try (or not) to preserve the position of the slats when the shutter reaches the target position.

- **Recover Position After Shutter Stops Motion**: sets whether to try (or not) to preserve the position of the slats after receiving an order to interrupt the shutter motion.

- **Position at Bottom**: defines the position the slats should move to once the shutter itself gets to the bottom position (100%, completely down).

The following objects are visible by default for every shutter channel:

- **[Shutter] Scenes**: 1-byte object for the reception from the KNX bus of scene orders, the response to which needs to be configured from the Scenes specific tab of each shutter channel, as explained later.

- **[Cx] Move**: 1-bit object for the reception from the KNX bus of the shutter move-up ("0") and move-down ("1") orders.

- **[Cx] Stop**: 1-bit object for the reception from the KNX bus of the shutter stop orders ("0" or "1"), which will interrupt any move-up or move-down order in execution. If the shutter has been configured as "Blinds (With Slats)", the name of the object will be "**[Cx] Stop/Step**" and it will implement exactly the same function (interrupt a move-up or move-down order in execution), plus the step control function: if the shutter is still, one "0" will be interpreted as a step-up order, and one "1" will be interpreted as a step-down order.

  Note: *successive step orders received before the end of the step movement will reset the step time counter.*

- **[Cx] Lock**: 1-bit object for externally locking ("1") or unlocking ("0") the shutter. When the lock trigger is received, the actuator will interrupt any action being performed and will ignore further orders received from the bus until the unlock trigger is received.

  Note: *lock orders are ignored if the shutter alarm is active (although the alarm state itself also implies that the shutter does not respond to external orders).*

2.2 FUNCTIONS

This screen lets the integrator enable/disable a variety of additional functions related to the shutter channel control.
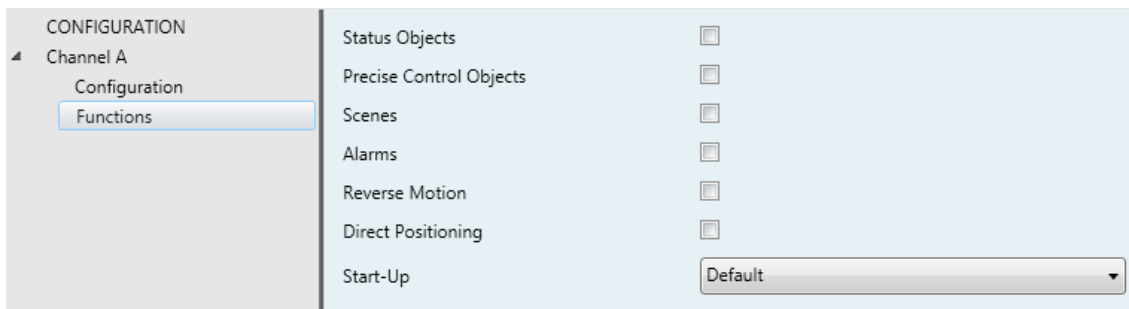
ETS PARAMETERISATION

Figure 2 Shutter Channel - Functions

- **Status Objects**: activates or deactivates the shutter/slats position status objects and/or the relays status objects, which should be configured from an specific parameter screen (see section 2.3)

- **Precise Control Objects**: enables or disables two 1-byte objects ("**[Cx] Shutter Positioning**" and "**[Cx] Slats Positioning**") that will accept precise position orders (in terms of percentage) from the KNX bus for the shutter and the slats respectively.

- **Scenes**: activates or deactivates the Scenes function, which should be configured from a specific parameter screen (see section 2.4).

- **Alarms**: activates or deactivates the Alarms function, which should be configured from a specific parameter screen (see section 2.5).

- **Reverse Motion**: enables or disables the "**[Cx] Move (Reversed)**" communication object, which is equivalent to "**[Cx] Move**" except for the fact that one "0" will move the shutter downwards and one "1" will move it upwards.

- **Direct Positioning**: activates or deactivates the Direct Positioning function, which should be configured from a specific parameter screen (see section 2.6).

- **Start-Up**: sets whether to perform the default action ("Default") or a custom action ("Custom") during the device start-up. The latter should be configured from a specific parameter screen (see section 2.7).

2.3 STATUS OBJECTS

The status objects inform about the relays status (i.e., the state of each of the two outputs that make up the shutter channel) and the position of the shutter/slats.

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After enabling "**Status Objects**" in the Configuration screen (see section 2.1), a new tab will be incorporated into the tab tree on the left.
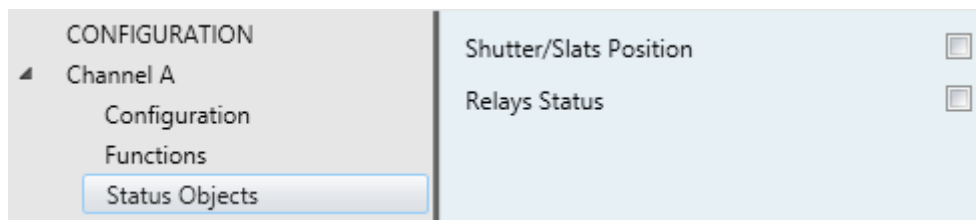

Figure 3 Shutter Channel – Status Objects.

The following objects types can be enabled:

- **Shutter/Slats Position**: enables or disables two 1-byte objects ("**[Cx] Shutter Position (Status)**" and "**[Cx] Slats Position (Status)**") that will reflect, respectively, the instant position of the shutter and of the slats (if available) in terms of percentage. 0% means shutter totally up (or slats totally open, with the light passing through), while 100% means shutter totally down (or slats totally closed).

  - ➤ **Periodic Notification While Moving [1s]**: sets whether the status objects should be sent (updated) every one second while the shutter or the slats are moving, or just at the end of the motion.

- **Relays Status**: enables two 1-bit objects ("**[Cx] Rising Relay (Status)**" and "**[Cx] Lowering Relay (Status)**") which will reflect, respectively, the status of the rising relay and the lowering relay. '0' means that the relay is open (no current passing through) and '1' means that the relay is closed (current passing through).

2.4 SCENES

The **Scenes** function allows setting the shutter (or the slats) to a certain position on the reception of a scene object.

ETS PARAMETERISATION

After enabling "**Scenes**" in the Configuration screen (see section 2.1), a new tab will be incorporated into the tab tree on the left.
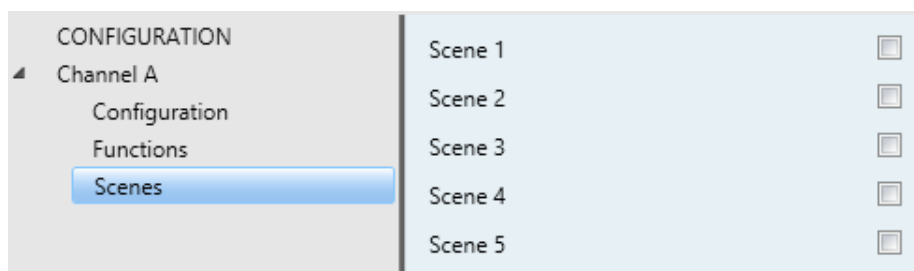

Figure 4 Shutter Channel - Scenes

Up to five scenes can be configured, marking the corresponding checkboxes (disabled, by default).
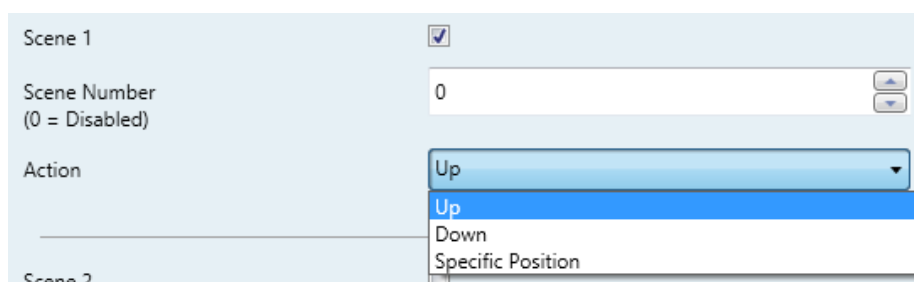
For each enabled scene, the following parameters appear:

Figure 5 Shutter Channel – Scene.

- **Scene Number**: sets the desired scene number, so that when that value is received (decreased by one, according to the KNX standard) through "**[Shutter] Scenes**", the action configured below will be triggered.

- **Action**: "Up" (default), "Down" or "Specific Position", respectively depending on whether the shutter should move to the top position, to the bottom position or to an intermediate position. The latter permits independently configuring a position for the shutter itself, for the slats, or for both.

2.5 ALARMS

The **Alarms** function allows moving the shutter (or the slats) to a pre-defined position on the reception of an alarm trigger from the KNX bus. Two alarms (i.e., two independent trigger objects with independent target positions) are provided per shutter channel. It is possible to configure not only the position the shutter will be set to on the alarm **activation** but also on the **deactivation**.

Cyclically monitoring the alarm trigger is also possible by defining a certain time period. The actuator will check that the alarm or no-alarm state is received at least once before the period expires (note: this check does not take place if the object has never been received yet). In case the object stops being refreshed (i.e., the actuator does not receive an updated value anymore), the alarm action will be performed as well, for safety reasons.

Regarding the deactivation of the alarm, it is also possible to configure a **simple deactivation** or an **acknowledgement-demanding** deactivation.

- The first case triggers the deactivation action as soon as the alarm object recovers its normal value.

- The second one, on the other hand, requires that an external acknowledgement (through another object) is received after the alarm object has recovered its normal value.

<u>**Notes**</u>:

- ***Alarms always prevail over any other function*** *(e.g.: lock orders during the alarm state will be ignored; alarm orders during the lock state will not).*

- ***Alarm 1 has a higher priority than alarm 2****. If the channel is in "alarm 2" and alarm 1 gets triggered, it will execute the action of alarm 1 and will wait till alarm 1 gets deactivated (switching then back to "alarm 2", but without executing again the action of alarm 2). On the other hand, while one channel is in "alarm 1", triggering alarm 2 will have no effect: the channel will remain in "alarm 1" until alarm 1 gets deactivated (in that moment the channel will perform the action of alarm 2).*

ETS PARAMETERISATION

After enabling "**Alarms**" in the Configuration screen (see section 2.1), a new tab will be incorporated into the tab tree on the left.
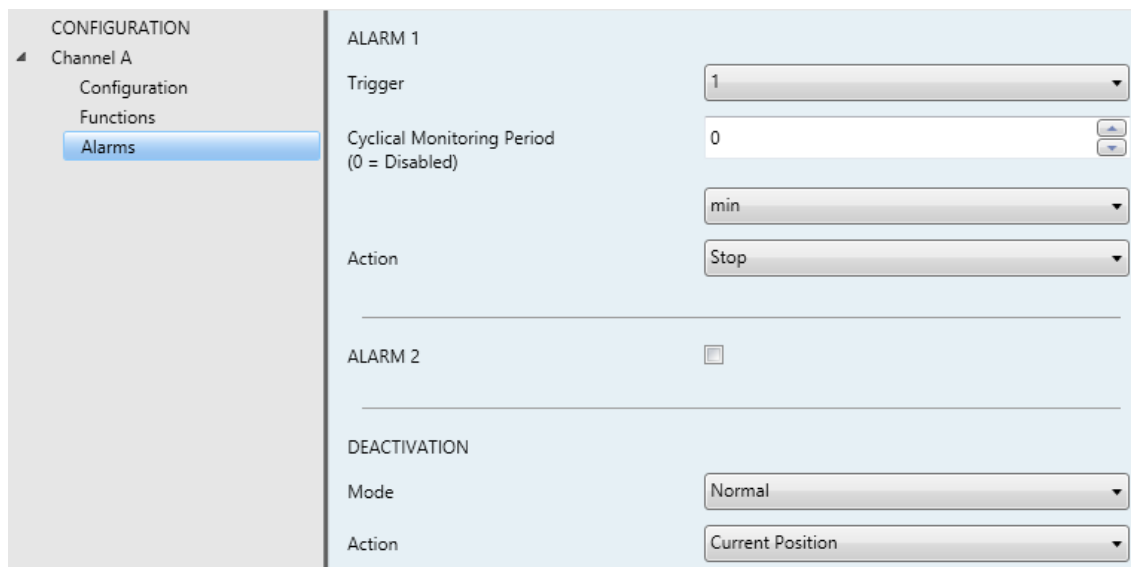

Figure 6 Shutter Channel – Alarms.

While the parameters of direct positioning no. 1 are shown by default, those of no. 2 are only shown after marking the corresponding checkbox.

- **Trigger**: sets the value ("1" –default– or "0") that, when received from the KNX bus through object "**[Cx] Alarm**" (or "**[Cx] Alarm 2**" for alarm no. 2), will be interpreted by the actuator as an alarm trigger and will therefore initiate the action configured below.

- **Cyclical Monitoring Period**: sets every how much time, at most, the alarm object should be updated from the bus <u>after an initial reception has already taken place</u>. if exceeded, and for safety reasons, the alarm action will be triggered as well. If this parameter is set to zero (default option), the cyclical monitoring function will remain disabled. Permitted values are 5 to 600 tenths of a second; 1 to 3600 seconds; 1 to 1440 minutes; and 1 to 24 hours.

- **Action**: "Stop" (default), "Up", "Down" or "Specific Position". Selecting the latter brings one or two more parameters:

  - ➢ "**Shutter Position**" and, if applicable, "**Slats Position**": they define, in terms of percentage, a specific target position the shutter and the slats will move to when the alarm is triggered.

- **Deactivation – Mode**: "Normal" (default) or "Frozen (Acknowledgement Needed)". The second option enables a new 1-bit object, "**[Cx] Unfreeze Alarm**", which should be used for externally unfreezing the alarm once "**[Cx] Alarm**" has received the no-alarm value (i.e., the inverse of the trigger value).

  Note: *the acknowledgement should be sent necessarily after "**[Cx] Alarm**" has acquired the no-alarm value. Sending it while the trigger value is still active will have no effect.*

- **Deactivation – Action**: sets the state the output should acquire once the alarm has been deactivated (and acknowledged, if required). It may be: "Current Position" (default), "Specific Position", "Off", "On" or "Last (Before Alarm)". When selecting "Specific Position" the following parameters appear:

  ➢ **Shutter Position** and, if applicable, **Slats Position**: they define, in terms of percentage, a specific target position the shutter and the slats will move to when the alarm is deactivated.

2.6 DIRECT POSITIONING

The **Direct Positioning** function permits moving the shutter (and the slats, if existing) to a pre-set, specific position by means of a 1-bit communication object. Two Direct Positioning functions are implemented per shutter channel, each with the option of *learning* new target positions in runtime (i.e., overwriting the one defined by parameter) by simply sending one "1" to the specific "save" object.

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Figure 7 Shutter Channel - Direct Positioning

While the parameters of direct positioning no. 1 are shown by default, those of no. 2 are only shown after marking the corresponding checkbox. These parameters are:

- **Shutter Position**: sets the position (in terms of percentage) the shutter will move to when one "1" is received through "**[Cx] Direct Positioning**" (or through "**[Cx] Direct Positioning 2**" for no. 2).

- **Slats Position** (only for shutter channels with slats): analogous to the above parameter, but for the slats.

With independence of the number of direct positioning functions enabled (one or two), the following parameter will also be shown:

- **Save New Positions**: if enabled, one new 1-bit object (or two, if Direct Positioning no. 2 is also enabled) will be added to the project topology: "**[Cx] Direct Positioning (Save)**" (and "**[Cx] Direct Positioning 2 (Save)**" for no. 2). When it receives one "1" from the KNX bus, the associated direct position will be overwritten with the current position of the shutter (and of the slats, if existing). Further triggers of the direct positioning functions will therefore take the shutter/slats to this new position.

2.7 START-UP

The **Start-up** function brings the option to set the shutter to a particular position during the start-up of the actuator.

- Default configuration: this will leave the shutter as is. Please note that on the very first start-up (after an ETS download), the actuator will assume the shutter is fully raised (at 0%).

- Custom configuration: Current Position / Up / Down / Specific Position, both after an ETS download and a bus power failure. Optionally, the status objects can be sent to the bus during after a customisable delay.

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After selecting a "Custom" **Start-up** in the Configuration screen (see section 2.1), a new tab will be incorporated into the tab tree on the left.
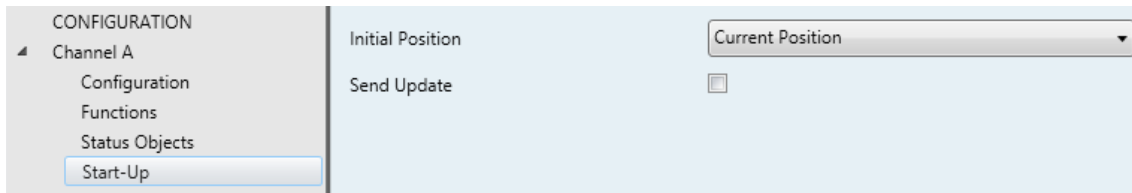
Figure 8 Shutter Channel - Start-Up.

This screen contains the following parameters:

- **Initial Position**: sets the position the shutter should acquire at the start-up of the actuator. It may be: "Current Position" (i.e., left as is; default option), "Up", "Down" or "Specific Position". The latter brings two more parameters:

  - "**Shutter Position**" and, if applicable, "**Slats Position**": they define, in terms of percentage, the specific position the shutter and the slats will move to when the actuator starts up.

- **Send Update**: sets whether the status objects should be sent to the KNX bus (in order to inform other KNX devices) after the start-up of the actuator. It is possible to impose a delay prior to this sending (0 to 600 tenths of a second; 0 to 3600 seconds; 0 to 1440 minutes; 0 to 24 hours) to ensure it takes place once the other devices are ready to receive it.

  Note: *this parameter is only visible when the Shutter/Slats Position status objects have been enabled.*